Students' Knowledge About Tobacco One Year After Receiving the PAL Smoking Prevention Program

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Abstract

A review of literature revealed that the control of cigarette smoking could do more to improve health than any other single action in the field of preventive medicine. In Ontario, since 1989, both Public Health Units and Boards of Educations have been mandated to provide educational studies related to tobacco use prevention. Even given this fact, there has been an increase in smoking behaviours at an earlier age and in females in particular.

Smoking prevention programs must use the most effective means to assist students to obtain the knowledge and skills required to remain or become nonsmokers. In the Niagara Region, PAL smoking prevention programs are offered in some, but not all, schools. As a form of program evaluation, this research sought to determine if students who had PAL could answer correctly a greater number of smoking-related questions than students who did not have this program. Findings reported that students who had PAL in Grade 6 were able to correctly answer more knowledge-based questions (at a statistically significant level), could provide ways to refuse cigarettes at a greater rate, and were able to provide more reasons for remaining nonsmokers. Students who had smoking prevention programming reported smoking behaviours at a lower rate than those who did not receive this type of program.

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Dedication

This thesis is dedicated to my husband, Edwin,

my son, Ross, and my daughter, Susan.

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CHAPTER ONE: THE PROBLEM

Introduction to the Problem

Tobacco is the only legal consumer product that kills when used exactly as intended (Ontario Council on Smoking and Health, 1991). According to the United States' Surgeon General's report (1994), smoking is the greatest health hazard of modern times and the greatest cause of preventable illness. This supports an earlier position statement of the World Health Organization (WHO; 1975) which identified smoking-related diseases as a prominent cause of premature death and disability in developing countries. At that time, the WHO stated that control of cigarette smoking could do more to improve health than any other single action in the field of preventive medicine.

The addictive nature of cigarette smoking has resulted in smoking being considered a world-wide epidemic. Like other epidemics, the resulting disease and disabilities caused by cigarette smoking are not isolated to specific age groups or social classes. In developed countries, such as Canada and the United States, smoking started as an upper-class male practice (Goodyear, 1991). By the 1930s, the habitual behaviour of cigarette smoking was adopted by all socio-economic groups, especially females (Greaves, 1989). The upward trends in cigarette smoking patterns were parallelled by an increase in related diseases. Long-term effects were mainly on the bronchopulmonary and cardiovascular systems. Smoking was estimated to be responsible for 30% of all cancer deaths which included cancers of the lung (related to 90% of all lung cancers), mouth,

throat, colon, pancreas, bladder, kidneys, stomach, and cervix. Tobacco use was associated with 25% to 30% of all cardiovascular diseases, with smokers having a 70% higher rate of coronary heart disease. Gastric and duodenal ulcers were twice as common and were twice as likely to cause death in smokers as in nonsmokers (Collishaw, Tostowaryk, & Wigle, 1988). Mackay (1990) predicted that rates of cigarette smoking related diseases, similar to those reported in developed countries, would emerge within developing countries, especially as tobacco use continued to increase.

In the province of Ontario, the death toll from cigarette smoking was staggering - almost five times the number of people who die from traffic accidents, suicides, and Acquired Immune Deficiency Syndrome (AIDS) combined (Schabas, 1991). According to Wigle (1990), of the 100,000 current 15-year-old Canadians who smoke, 1,200 adolescents will die from motor vehicle traffic accidents, 900 will commit suicide, 130 will be murdered, 70 will die from AIDS, and 18,000 will die from smoking-related illnesses.

King and Coles (1992) reported on the data findings from the 1990 international cross-sectional survey by the World Health Organization. The survey findings reported that female smoking rates were seven percentage points higher than male rates at age 15 (Grade 10) with 15, 22% of males and 29% of females smoking daily. For those 15-19, the smoking prevalence in Canada had risen to 29% which equalled the rates of adult smokers (Statistics Canada, August 1994). According to Brown, Cherry, and Forbes (1976), students experiment with cigarettes at an early age. More that half the students

in this study reported that they had tried smoking by age 12. Similar findings were reported in a technical report by Health and Welfare Canada (1977). A later study by King and Coles (1992) reported that Canadian children begin smoking by age 11.

Cigarette smoking can lead to physical and psychological dependence on nicotine (The United States' Surgeon General's Report 1981). The addictive effects of nicotine in cigarette smoke are directly time and dose related (Batty, 1988). In 1994, the Council for a Tobacco-Free Ontario stated that "a child could become addicted to cigarettes after smoking as few as five cigarettes" (p. 16). The addictive properties of cigarettes have been compared to the addictive properties of heroin, cocaine, and alcohol (Henningfield, Clayton, & Pollin, 1990; Henningfield, Cohen, & Slade, 1991; Kozolwski, Henningfield, Keenan, Lei, Leigh, & Jelinek, 1993). In spite of the parallel between cigarette smoking addiction and addiction to other substances, the U.S. Surgeon General (1994) has passed the simple comment referring to the elimination of cigarette smoking among adolescents as the front line in the war against tobacco use. This statement failed to recognize the extent of the problem or to offer strategies to deal with this life threatening, addictive behaviour.

The expected risk of illness and death related to cigarette smoking is directly proportional to the duration and the amount smoked (Bartechhi, MacKenzie, & Schrier, 1994). Therefore, although a discussion of the dangers related to cigarette smoking must be presented to children and adolescents, the expectation is that the presentation of a program like Peer Assisted Learning (PAL) Smoking Prevention Program should reduce the number of adolescents who will become adult smokers.

Rationale

Presenting the outcomes related to specific behaviours may not be sufficient to alter an individual's behaviour (Botvin & Botvin, 1992; Eckhardt, Woodruff & Elder, 1994). However, increasing an individual's level of understanding and knowledge about an outcome may lead to changes in an individual's behaviour. It is expected that the greater the knowledge an individual has about a subject, the more able the individual is to incorporate this knowledge into the decision-making process, and the subsequent maintenance of, or acquisition of, specific behaviours.

The research question in this study is related to knowledge about tobacco use among Grade 7 students. Since smoking was identified as a major health hazard, smoking prevention is needed in schools.

Many studies on health education related to tobacco use recognize that traditional health education approaches have not had a sustainable effect on behaviour. Information alone is seldom sufficient to initiate behavioural changes (Silvestri & Flay, 1989). Some programs could document the benefit of booster programs when offered by adequately trained teachers (Tortu & Botvin, 1989). Booster classes are offered in either, or in both, Grades 7 and 8. These classes provide a review of earlier taught tobacco related material.

The fact that education alone is not sufficient to prevent the onset or the habituation of smoking does not mean that education should not be used in prevention programs (Farrow & Samet, 1991). Young people, who remain nonsmokers, must be provided

with adequate knowledge to reinforce their decisions (Schabas, 1993). Smoking prevention programs such as the Peer Assisted Learning (PAL) program use multiple strategies that go beyond the recognition of information. These programs offer "active" learning situations which acknowledge the role of social pressure and develop skills to resist these pressures (Abernathy & Bertrand, 1992). Knowledge and strategies are made available to the students to assist them to cope with social pressure in general and to the pressure to smoke in particular. The PAL smoking prevention program incorporates peer leaders into the program. Peer leaders act as role models (Garcia, d'Avernas, & Best, 1988). They teach their cohorts about the effects of social influences on behaviours along with skills to resist these influences on a daily basis. Once these skills are learned, they are practiced, through role playing, to prepare the student to incorporate them into future life experiences.

Statement of the Problem

The present study was designed to determine if Grade 7 students, who received PAL, a standardized smoking prevention program based on the Social Influence Model, had a greater knowledge about cigarette smoking than age-matched individuals who either received another smoking prevention program or did not receive any program.

Purpose of the Study

The purpose of this study was to determine the knowledge level of Grade 7 students one year after receiving a standardized smoking prevention program entitled Peer Assisted Learning (PAL). Knowledge in the "treatment group" (i.e., students receiving PAL) was compared to students who did not receive PAL*.

Hypothesis

There is no difference in knowledge related to tobacco use in students who received a standardized smoking prevention program (PAL) versus students who received either a nonstandardized smoking prevention program or no program at all.

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* Some students may have discussed smoking in health classes and/or in a nonstandardized smoking prevention program.

Assumptions

Several assumptions were presented in this study:

- The primary assumption was that increased knowledge would impact on attitude and ultimately on behaviour.
- Students who had a greater knowledge related to tobacco use would have more readily available rationale and refusal skills to resist initiating this addictive behaviour or to assist those currently smoking to quit.
- Experimental controls used in this research would identify the variance in knowledge related to tobacco as an outcome of a smoking prevention curriculum.
- A finding of increase knowledge related to tobacco among students who had received a specific smoking prevention curriculum would encourage more teachers to become trained in that particular program. These trained teachers would then incorporate the program into the requirement for Personal and Social Studies: Self and Society (learning outcomes, understanding the danger of smoking and drug abuse, as well as some reasons why people use tobacco and other drugs) found in the Common Curriculum for Grade 6 (1995).

Limitations and Delimitations

Limitation

Questionnaires call for self-report data, in which case there is a potential for a reduced validity and/or reliability due to subject and reporting biases. Subject bias may

cause the student to answer the questionnaire in a manner that he or she believes the researcher is looking for, especially if he/she thinks he/she will be identified, in which case the answers may not necessarily reflect reality (validity). This would also jeopardize future researchers' ability to reproduce similar results later (reliability).

Delimitation

Recognizing this constraint, data were collected in a way that decreased motivation to under/over report. The following script was read by a trained Public Health Nurse:

> This survey is being carried out with various Grade 7 students in the Lincoln County Board of Education. The information that we receive from you will be important to help us plan our future programs. This survey is strictly confidential. Do not put your name on it; fold it in half when you are finished so nobody else sees your answers. Therefore, answer as honestly as possible.

Limitation

The Grade 7 Lincoln County Board of Education Smoking Survey contained 38 questions and was administered in the classroom during a time frame of 20 minutes. All students may not have been at the same reading comprehension level and may not have been able to complete the survey.

Delimitation

A trained Public Health Nurse delivered the questionnaire orally and responded to any queries from students.

Limitation

There is always the possibility of contamination of the survey. This could occur if one group of students had been exposed to the survey and discussed it with a second group of students before the second group of students completed the survey.

Delimitation

To avoid contamination by prior knowledge only one Grade 7 class was surveyed per school.

Limitation

In the Niagara Region, there are approximately 5,000 Grade 7 students in four boards and 120 Grade 7 students within private schools. It would take approximately two months to reach all Grade 7 students. This could cost several thousands of dollars in Public Health Nurse wages to coordinate and administer the survey, along with the cost of travel throughout the Region.

Delimitation

For this research the Lincoln County Board of Education was chosen. There are

1,477 Grade 7 students in the Lincoln County Board of Education. A sample of 450 students representing 30% of the entire population was surveyed.

Limitation

The PAL program was offered by some, but not all, public health nurses and teachers in the Lincoln County Board of Education.

Delimitation

Since some, but not all, of the target group have had the PAL Smoking Prevention Program, it was necessary to compare these students with their cohorts who have had another or no smoking prevention program.

Limitation

There was potential that the research could be contaminated by extraneous factors in the individual school and/or classroom (i.e., a car accident on the street in sight of the classroom).

Delimitation

Potential for contamination by extraneous variables was controlled by providing adequate training of the individual (Public Health Nurse) distributing and collecting the questionnaires. To ensure standardized presentation of the survey, the trained Public Health Nurse gave the teacher a written protocol and script.

Limitation

School was not the only venue for obtaining knowledge related to tobacco use. Information may have been provided at home, by peers, or by the media.

Delimitation

This possibility was recognized and like comparison groups were surveyed to control outside influences on tobacco use knowledge.

Definition of Terms

The following definitions are given in order to develop a familiarity for the reader of the conceptual terms referred to in this study:

Social Influence Model - A model that identifies the ability of social pressure and social modelling to affect another person's behaviour. In the case of smoking, family, peer and media are considered to have the greatest pressure and corresponding influence on adolescent smoking (Best, Perry, Flay, Brown, Towson, Kersell, & Ryan, 1984).

Social Influence Programs - Multi-component programs designed to teach an awareness of, and skills that, counteract social pressure related to substance use (Flay, Ryan, Best, Brown, d'Avernas, & Zanna, 1985).

Standardized Smoking Prevention Program - A prearranged teaching plan which addresses nonsmoking using a uniform model (Flay, et al., 1985).

CHAPTER TWO: REVIEW OF LITERATURE

Part A: Social Influence Approach to Smoking Prevention

Smoking Prevention Programs

According to Botvin and Botvin (1992), numerous anti-smoking education programs have been developed and implemented over the past two decades by schools, voluntary health agencies, education, and researchers. These anti-smoking programs gave students information to resist tobacco use. Many of these programs have not received rigorous evaluation. Therefore, it has been difficult to judge the efficacy of such programs (Glynn, 1990). For years, and through various educational methods, the message "don't start" has been directed at children all over the world (Mackay, 1990). Original programs focused of classroom lectures which provided information which described adverse health effects and consequences of tobacco use (Silvestri & Flay, 1989). Recent research into social influences on smoking behaviours led to the development of more sophisticated interventions (Bruvold, 1993). The Peer Assisted Learning (PAL) smoking prevention program, developed by Health and Welfare Canada (1986), was an example of a comprehensive social influence program (see Appendix A).

In 1994, Health Canada and the Canadian Cancer Society conducted the National Survey of School Smoking Prevention Programs. The criteria used for evaluating school programs were developed under Glynn's leadership for the U.S. Cancer Institute (Glynn, 1989, 1990) and modified by Health Canada and the Canadian Cancer Society. These

modifications were made after extensive review and analysis of the evaluation results of the PAL program (Abernathy & Bertrand, 1992) and a survey of the Canadian Cancer Society provincial/territorial divisions of factors influencing effective implementation. The National Survey of School Smoking Prevention Programs was conducted between September 1992 and May 1993 and received a response rate of approximately 90% from the elementary school level (up to Grade 8).

The four areas assessed were: focus, content, delivery, and implementation and adoption. Three nationally available smoking prevention programs met most of the criteria (see Appendix A). The programs identified were: Lungs are for Life, PAL, and Quest. Health Canada recommended that emphasis should be placed on ensuring effective implementation of the best programs rather than developing new social influence programs. Identified means of effective implementation required that the programs be promoted in schools and that teachers, public health nurses or appropriate personnel be properly trained to implement the programs. Health Canada (1994) stated that program leaders should receive sufficient resources, including time, to implement programs fully and with fidelity.

The Quest program met 22 of the 24 criteria when the students attended all three components of the program. This program was identified as "bulky" since it consisted of many more than 150 lessons in the Skill for Adolescence component. The PAL program satisfied 19 of the 24 criteria. Health Canada recommended: that the PAL program be retained as a school-based smoking prevention activity; that appropriate training opportunities be made available for those who would be implementing the program; and

that gaps in the program would be addressed. Emphasis for future changes to the PAL program were identified based on recognized gaps within the program. The National Survey on School Smoking Prevention Programs (1994) and an earlier study by Abernathy and Bertrand (1992) realized that there was a need for the development of modules that addressed the uniqueness of specific groups, including young women. The distribution of learning criteria in the National Survey (1994) required that the smoking prevention program be delivered in at least two school years and contain at least 10 lessons on tobacco. It was recommended that the PAL program develop a plan to ensure this program met the appropriate distribution of learning criteria. The third identified gap in the PAL was the integration of the program with other areas such as drugs and alcohol. Health Canada (1994) suggested the development of support materials that outlined potential ways for PAL to be integrated into the curriculum.

Description of PAL Smoking Prevention Program

The PAL smoking prevention program was considered a primary prevention program. This program recognized that tobacco use was promoted and supported by social influences from peers, family, and the media (Abernathy & Bertrand, 1992). Pentz (1983) reported that early adolescence was the first risk period for substance use. Acknowledging this finding, the PAL program targeted early adolescents, before the first risk period for substance use.

In 1986, the Health Promotion Directorate of Health and Welfare Canada introduced the PAL smoking prevention program as an integral part of its initiative entitled -

"Towards a Generation of Non-Smokers" (see Appendix B). Based on the social influence model (Evans, 1976; McGuire, 1964) for smoking prevention, PAL was designed to give adolescents information concerning the benefits to their lives when they chose not to smoke (Abernathy & Bertrand, 1992). In addition, PAL smoking prevention programs attempted to foster the interpersonal skills required to resist peer pressure to smoke. The PAL smoking prevention program concentrated on influencing behaviours through knowledge, skill building, coaching, and rehearsal (PAL, A Peer-Assisted Learning Resource, 1986).

Explicit teaching and active learning techniques were utilised to retrieve a student's prior knowledge of tobacco use (Mayer, 1987). Issues such as inaccurate assumptions by students that smoking behaviours are the norm for society (normative expectations) were explored by means of peer interactive discussion groups (Perry & Kelder, 1992; St. Pierre, Shute, & Joycox, 1993). Through the process of peer interactive groups, peers helped each other to obtain accurate knowledge about cigarette smoking. The use of this strategy in the PAL program incorporated aspects of the Social Learning Theory (Bandura, 1977). The Social Learning Theory placed primary emphasis on how people learn from one another. Bandura theorized that learning occurred by means of observing others behaviours. Learning was felt to occur when the person observed another's behaviour within the context of a social situation, imitated the behaviour, and adopted it as his/her own. The Social Learning Theory assumed that social behaviour was under the control of environmental factors (Bandura, 1977). Peer leaders and teachers employed the Social Learning Model to practise and reinforce resistant skill (PAL, A Peer Assisted

Learning Resource, 1986). The use of modelling by peer leaders and instructors assisted students to develop the interpersonal skills required to resist the pressures to smoke (Fischer, Armstrong, & de Kler, 1983).

The content of the PAL program was delivered to Grade 6 students over eight weeks with optional booster sessions available for Grades 7 and 8. The PAL program incorporated the following teaching strategies in program delivery: peer interactive group discussions, peer leaders, modelling, drama structures, visual art, and classroom presentations (PAL, A Peer-Assisted Learning Resource, 1986). The use of peer interactive discussions in the classroom provided students the opportunity to share experiences in a new learning situation (Mayer, 1989). Students heard the thoughts and feeling of other students on the smoking-related topics, discussed in a vocabulary which was familiar to the students and acted to facilitate learning and understanding (Perry & Kelder, 1992). Peer leaders and regular classroom teachers acted as role models during the PAL sessions as a mechanism for developing a comfort level and a guide for behaviours.

The use of drama structures combined body movement and discussion, helping the learner verify the information. This occurred through more than one communication system and in sematic, episodic, and procedural forms (Hoyt, 1992). Drama structures assisted in both the attainment of knowledge (Mayer, 1984) and the retaining of knowledge (Mayer, 1989).

Visual art has been identified as a powerful motivator (Hoyt, 1992). Art offered students an alternative way to express their understanding of an issue such as tobacco

use (Hoyt, 1992). A study by Seigel (1984) reported that students who had difficulty with written and oral language found that artistic expression assisted them to organize thinking and rehearsal to learn through this strategy. Artistic representation required the student to reflect on the topic, select a focus, and analyse it before the picture could be drawn. Seigel (1984) described this process as encouraging the learner to use visual images to express his/her understanding. This strategy could assist students who do not have traditional means of learning readily available to them (e.g., learning disability).

Evaluation of the PAL Program

Abernathy and Bertrand (1992) reported on the results of a four-year evaluation of the PAL smoking prevention program. There was a 9% decrease in the onset of smoking between male subjects exposed to the complete PAL program, three years earlier, versus an untreated group. Unfortunately, the same results were not demonstrated in the female population. Negligible effects were demonstrated in females (Abernathy & Bertrand, 1992). Although the effect rates varied between genders, this finding still supported the widespread use of the PAL program. A 9% reduction in smoking could translate into substantial health benefits over time.

Social Influence Model

Social influence prevention approach posited that resistance to using tobacco would be greater if one had developed an awareness of skills that counteracted social pressure to smoke (Sussman, Dent, Stacy, Hodgson, Burton, & Flay, 1993). Smoking prevention

programs based on the social influence model provided learning situations that focused primarily on social influences to smoke and helped to develop skills to resist these influences (Garcia et. al., 1988). Traditional health education approaches which provided information about tobacco use were seldom sufficient to initiate behavioural changes (Charlton & Blair, 1989; Garcia et. al, 1988). The use of the Social Influence Model (Sussman et al., 1993) went beyond strict dissemination of information and offered "active" learning situations. These active learning situations focused on the attainment of knowledge, specific skills and the correction of misconceptions in a learning situation (Flay et al.,1985). The targeted group was explicitly made aware of social influences which promoted substance use: those of peer pressure, family pressure/pro-smoking behaviours, and the media (Bandura, 1977; Best, Perry, Flay, Brown, Towson, Kersell, & Ryan, 1984; Flay, d'Avernas, Best, Kersell, & Ryan, 1983; Hunter, Croft, Vizelberg, & Berenson, 1987). Long-term follow-up studies on the correction of misconceptions found that the interventions faded during the second year (Flay, Koepke, Thomson, Santi, Best, & Brown, 1989; Murray, Davis-Hearn, Goldman, Pirie, Luepker, 1988).

Social Inoculation

Underlying the social influence approach was the assumption that adolescents could be socially inoculated against social influences to smoke (Haukkala, Uutela, Vartiainen, Burton, & Johnson, 1994). This was a gradual process whereby the adolescents were exposed to progressively more intense pro-smoking social influences to which they

learned to say "no" (Evans, 1976; Evans, Rozelle, Mittlemark, Hansen, Bane, & Havis, 1978; Haukkala et al., 1994; McGuire, 1964). This process was similar to biological inoculation whereby a person was exposed to a small dose of an infectious agent to develop antibodies to resist disease on subsequent exposure (Botvin & Botvin, 1992).

When the social inoculation was applied to smoking, an individual developed counter arguments against social influences to smoke (Flay et al., 1985). The counter arguments, developed in a controlled situation, were intended to "inoculate" the adolescent against social influences later and in different situations (Garcia et al., 1988).

Peer Leaders

Peer leaders taught students skills for resisting pressure to smoke cigarettes. The use of same-age or older peer leaders was a feature evident, to varying degrees, in many social influence programs (Bruvold, 1993; Perry & Kelder, 1992). Research by Fischer, Armstrong, and de Kler (1983) found boys and girls equally affected by social influence programs delivered by a teacher. In peer-led programs, girls may have been more positively affected than boys. A study by St. Pierre, Shute, and Joycox (1993) found peer leaders had been successful, as did a later report by Perry and Kelder (1992).

The Concept of Risk

The effect of traditional programming on smoking initiation varied from those of the social influence program. Similarly, high risk students' smoking initiation rates varied from those of low risk students. The Waterloo Smoking Prevention Program identified

students' risk of becoming smokers based on two factors:

a) the prevalence of social models who smoked (peer, family, others)

b) previous smoking experience.

Students who had some experience with smoking and those with peers and family models were identified as high risk for smoking behaviours (Farrow & Samet, 1991; Flay et al., 1983; Graham, Marks, & Hansen, 1991). Students with limited smoking experience and no smoking models were considered at low risk of initiating smoking (Best et al., 1984). Research has reported that programs which reduced smoking behaviour in high risk students (two or more smoking models) have had a greater significance (Best et al., 1984; Farrow & Samet, 1991; Flay et al., 1989). These students had an elevated potential of remaining or becoming smokers (Flay et al., 1985). The 1984 study of the Waterloo Smoking Prevention Program by Best et al. suggested those low risk groups (no or one smoking model) were the least likely to start smoking with or without a smoking prevention program.

Evaluation of Social Influence Programs

Many social influence programs have been evaluated over time and in different areas (Tobler, 1986; Bruvold, 1993). The Waterloo Smoking Prevention was a long-standing program developed in Ontario and, like most other social influence programs, was provided through a school curriculum at the elementary level.

A longitudinal study of the Waterloo Program by Best et al. (1984) found that the program worked best for the high risk student. By the end of Grade 8, the program was

found most beneficial for children who had two or more smoking models in their environment. Later research by Flay et al. (1985) reported similar findings. High risk subjects reported significant program effects for those with peer and family models.

Flay et al. (1989) conducted a six-year follow-up of the Waterloo Smoking Prevention Program. A large scale study looked at the long-term effects of this social influence program. While the program did not reduce the level of regular smokers or significantly increase the probability of remaining a nonsmoker, it was successful in preventing the onset of experimental smoking, up to Grade 8. This was significant since delayed onset was associated with an improved prognosis for quitting (Schwartz, 1992). The effects on the students who were experimenting in Grade 7 and 8 had completely decayed by the time they reached Grade 12. This suggested a need for booster programs to continue into high school (Flay et al., 1989).

Sussman et al. (1993) researched the Project Towards No Tobacco Use (TNT) which uses a social influence approach. This research looked at a mode of implementation and behavioural outcomes. Favourable process ratings were obtained for comprehensive programming. It was speculated that different causes of tobacco use need to be counteracted simultaneously because the behaviour is determined by multiple causes (Sussman et al., 1993). A heterogeneous program might reach a wider variety of youth who may differ in risk factors that influence use related to their cultural background, socioeconomic background, and gender.

Abernathy and Bertrand (1992) conducted a four-year evaluation of the Peer Assisted Program (PAL), a social influence smoking prevention program. The intent of

this program was to prevent students from ever experimenting with smoking. Males exposed to the entire program were more likely to report that they had never smoked, a difference of 9% compared to those who had not received the PAL (Abernathy & Bertrand, 1992). A 9% reduction in smoking rates could be significant since this could translate into substantial health benefits over time. However, negligible effects of PAL were obtained for females, which suggested that prevention programs would have to consider targeting males and females differently, given the rising smoking rates in females (Greaves, 1990).

Psychosocial influences of cigarette smoking among youth were researched by Hunter et al. (1987) as part of an ongoing surveillance for cardiovascular disease risk factors in a pediatric population (ages 8-17 years). This study concluded that there was a need for smoking prevention programs to intervene at the level of the social influence (parental, peer, and sibling smoking behaviours). In support of the social influence model, this study suggested that the experimenter be assisted to identify normative reality and to learn resistance skills.

The uses of the social influence approach have been expanded beyond smoking prevention to include alcohol and drug abuse. McAlister, Perry, Killen, Slinkard, and Maccoby (1980) researched the effectiveness of this preventive strategy. Findings suggested that the onset of behaviours like smoking, alcohol use, and marijuana use could be deterred by training young adolescents to resist the temptation and inducement from peers and others.

From the abundance of research supporting the social influence model to smoking

prevention, Garcia et al. (1988) published a paper entitled "We Know What Works, Now Let's Make It Happen." This document discussed the extent of the smoking problem on youth and gave support for the implementation of the PAL program throughout Ontario schools. Garcia et al. (1988) reported on the signing of a resolution by the Addiction Research Foundation, the Canadian Cancer Society (Ontario Division), The Heart and Stroke Foundation, the Lung Association and the Mental Health Foundation which called for the teaching of smoking as a major health issue. A joint request was also made to the Ministers of Health and Education by the Ontario Interagency Council on Smoking and Health and the Drug Education Coordinating Council. It sought to ensure that social influence programs would be considered mandatory core programs under the Health Protection and Promotion Act. It also requested that the social influence approach be acknowledged as effective in the reduction of tobacco use among children and that this be communicated to all Boards of Education in Ontario.

Garcia et al. (1988) advocated that social influence programs be widely implemented in schools. In response to this and to other research findings, the Ontario Ministry of Health introduced the following mandate in 1989: all public health units/departments across the Province of Ontario must ensure the implementation of smoking prevention programs that use a social influence approach in schools. Also in 1989, the Ontario Ministry of Education in Ontario mandated that tobacco education be taught to students from Grades 4 to 10.

Importance of the PAL Smoking Prevention Program

The Common Curriculum, the basic curriculum document for elementary level education in Ontario, was distributed in 1993. This outcome-based document emphasized educational results including knowledge, concepts, and abilities that students should acquire. Ten essential cross-curricular learning outcomes were identified. One of the core areas, that of Personal and Social Studies: Self and Society, required that, by the end of Grade 6, students would understand and discuss information about drugs and tobacco, their effects on the body, the reasons why people used substances (including peer/societal pressure), and the rights of the nonsmoker. By the end of Grade 6 students should be able to use relevant information to make responsible personal choices about health, lifestyle, and relationships (Ontario Ministry of Education and Training, 1995).

The PAL smoking prevention program, offered initially in Grade 6, provided knowledge, skills, and decision-making strategies which correspond with the essential outcomes identified in the Ontario Ministry of Education Common Curriculum (1993). However, Kelder, Perry, Klep, and Lytle (1994) concluded that interventions should begin before the sixth grade, before behavioural patterns are resistant to change.

The comprehensive social influence program, PAL, sought to increase knowledge about, and resistance to tobacco use by means of social inoculation and peer interactive discussion. Students were taught to recognize social influence pressures and were motivated to develop the ability to resist them (Garcia et al., 1988). Drama and visual art methodologies assisted the students to acquire problem-solving skills that could be applied to many situations in their ever changing world (Seigel, 1984; Hoyt, 1992). Peer

interactive discussions about tobacco use provided students the opportunity to discuss personal experiences which reflected racial and ethno cultural heritage as it related to tobacco. Students learned how to express themselves, follow their own convictions (e.g., remain smoke-free), and yet not alienate themselves from their peer group (Hoyt, 1992). It was recognized that the peer group interaction was essential to the adolescence lifestyle (Elkind, 1978).

The social influence approach and the variety of learning activities in the PAL program helped students to gain knowledge about their personal response to pressure (Abernathy & Bertrand, 1992). The students also learned to respect the response of others within their multicultural school setting.

Tobacco as a Gateway Drug

Tobacco, with alcohol and marijuana, is considered a gateway drug (Czechowicz, 1988; Eckhardt et al., 1994; Glynn, Anderson, & Schwarz, 1991; Torabi, Bailey, & Majd-Jabbari, 1993). Tobacco use in early adolescence has been associated with illegal drug use in later life. Conversely, illegal drug use was a good predictor of smoking. Kandel (1975) found that cigarette smoking and alcohol use generally precede marijuana smoking and other illegal drug use. Monitoring The Future Project (MTFP) (U.S. Department of Health and Human Services, 1988) confirmed that illegal drug use was rare among those who have never smoked. It also found cigarette smoking was likely to precede the use of alcohol or illegal drugs. The 1985-1989 MTFP showed that 98 percent of persons who had used both cocaine and cigarettes smoked first. This three-

year study tested the effectiveness of substance abuse prevention programs incorporating the social influence approach. Significant prevention effects for cigarette smoking, marijuana use, and immoderate alcohol use supported earlier findings by McAlister et al. (1980). Prevention effects were also found for normative expectations and knowledge concerning substance use, interpersonal skills, and communication skills (Botvin, Baker, Dusenbury, Tortu, & Botvin, 1990).

Schabas (1993) stated in his report entitled Opportunities for Health that, "we must ensure that young people are knowledgeable about tobacco and have decision making skills to make healthy choices and that these skills are linked with education about alcohol and drugs" (p. 5). The PAL program recognized the role that cigarettes played as a predictor of other drug use and the effectiveness of the social influence approach on substance use. Through PAL, students were assisted to avoid the potential gateway effect of tobacco when they acquired the knowledge and the skills required to resist the pressures to smoke (Abernathy & Bertrand, 1992).

Part B: Knowledge Acquisition

Retention of Knowledge

Young people who remain nonsmokers must be provided with adequate knowledge upon which to reinforce their decision. Building this knowledge was described by Mayer's Model (1992) using the cognitive model of knowledge construction. This model consisted of four stages. In the first stage of knowledge construction, an external

stimulus was either attended to by the individual or filtered out and discarded. Once accepted and attended to, the stimulus entered into the second stage: that of the short-term memory. The short-term memory had a limited capacity and lasted approximately 30 seconds without a rehearsal. Short-term memory was commonly called working memory since information was temporarily held here for immediate use. Short-term memory was primarily auditory; therefore interventions that used auditory modes facilitated short-term memory. Information in short-term memory was either rehearsed or forgotten in approximately 30 seconds or upon being displaced by new information, whichever came first (Mayer, 1984).

Rehearsals operated to transfer information from short-term into the third stage, that of long-term memory. Information/knowledge existed in long-tem memory in sematic, episodic, or procedural form (Mayer, 1987). It could be used in the future as a base upon which future knowledge could be built. In the fourth stage, knowledge in long-term memory returned to short-term memory upon a cue, thereby connecting prior knowledge with new information. According to this model, learning occurred when the learner selected relevant information, organized that information into a coherent whole, and integrated that information with existing knowledge (Mayer, 1984, 1987, 1989). This resulted in the construction of new knowledge (Mayer, 1992) (see Figure 1).

Role of Prior Knowledge

Long-term or prior knowledge has had both a positive and a negative effect on the acquisition of new knowledge (Ceci, Caves, & Howe, 1981). Lipson (1982) reported that

students were more proficient at acquiring totally new information than at correcting old information (prior knowledge) that was inaccurate (misperception). This phenomenon occurred even when prior knowledge was contradicted. It was only when subjects did not possess the necessary prior knowledge, or believed they did not possess the necessary prior knowledge, that they embraced new information (Sussman et al, 1993). Ceci et al. (1981) suggested that memory distortion for incongruous information (e. g., almost 70% of adolescents do not smoke) was influenced by prior knowledge and not the result of random forgetting.

Inaccurate prior knowledge and/or misperception played a major role on social influence (Eckhardt et al., 1994). An example of this was a nonsmoking students who, after standing smoking beside a group of smoking students, reported smoking to be a normative behaviour (Botvin & Botvin, 1992). One fundamental strategy of the PAL program was behaviour to correct misperceptions of social norms regarding tobacco use (Abernathy & Bertrand, 1992).

Part C: Extent of the Problem

Adolescent Cigarette Smoking Behaviours

According to Botvin and Botvin (1992), adolescents who chose to use substances such as tobacco did so as the result of multiple factors. These factors included a complex mixture of cognitive, attitudinal, social, personality, pharmacological and developmental components (Botvin & Botvin, 1992). The single most important factor

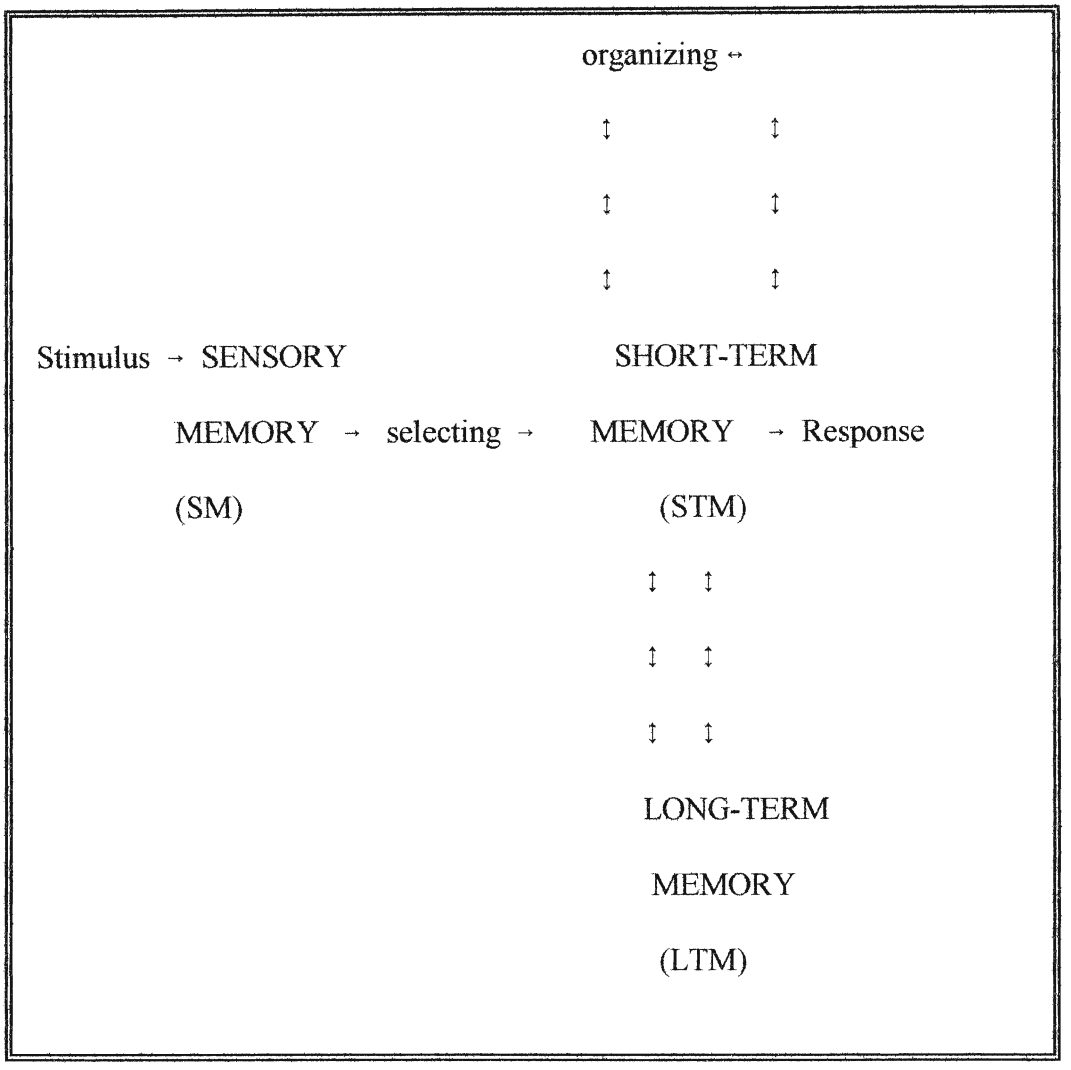

Figure 1. Mayer's (1992) Model of Knowledge Construction.

that promoted substance use was whether or not significant others such as parents, older siblings, and/or friends engaged in substance-use (Eckhardt et al., 1994). Adolescents took part in certain behaviours due to the favouring of those behaviours by significant others, most often peers (van Roosmalen & McDaniel, 1992). Those whose friends or family members smoked, drank or used drugs were significantly more likely to become substance users themselves than those whose family members and friends did not (Glynn et al., 1991). Green (1979) found that about 75% of adolescent smokers had parents who smoked. Allen (1993) found about 80% of adolescent smokers had one best friend, male or female, who smoked.

Individual characteristics were found to be associated with substance use. These characteristics included: low self-esteem, low self-confidence, low assertiveness, great impulsivity, rebelliousness, high anxiety, low sense of personal control and an impatience to acquire adult status (Botvin & Botvin 1992; Eckhardt et al.,1994; Flay et al., 1983; Graham et al., 1991; King & Coles, 1992; Reimers, Pomrehn, Becker, & Lauer, 1990). In the 1994 Report on Youth, the Chief Medical Officer of Health for Ontario (Schabas) recognized smoking as a behaviour that did not occur in isolation. Young people who smoked were identified as dating earlier, staying up late, missing school, and displaying rebellious behaviours. These youth were described as more likely to have lower career aspirations, low self-esteem and a poor self-image (Kelder et al., 1994; Reimer et al., 1990; Schabas, 1994). Adolescents who used substances were not generally involved in sports and clubs, more often exhibited antisocial behaviour, and were involved in premature sexual activity, truancy and delinquency (Botvin & Botvin,

1992; Escobedo, Marcus, Holtzman, & Giovino, 1993).

Female adolescents tended to be more conforming to peer pressure than did males (Abernathy & Bertrand, 1992). As adolescents became more concerned with their public image, they were particularly vulnerable to sophisticated advertising designed to associate tobacco with a particular image (Covell, 1992). During adolescence there was a decline in parental influence with respect to lifestyles along with a corresponding increase in reliance on peer groups (Elkind, 1978). If substance use were consistent with the norms of their friends or the reference group, there was an increased tendency to conform to the group norm with respect to cigarette smoking (Evans et al., 1978; Charlton & Blair, 1989).

Adolescent Smoking Behaviours

Six reports by the U.S. Surgeon General (U.S. Public Health Service, 1964, 1979, 1980, 1981) illustrated the wide-ranging influence that smoking has had on health. Adverse effects of smoking included: increased risk for heart disease, lung cancer, chronic bronchitis, peptic ulcer, respiratory disorders, damage and injuries due to fires and accidents, lower birth weight, and retarded fetal development.

In Canada, the National Clearinghouse on Tobacco and Health complied several recent surveys finding into a report entitled Focus On: Youth and Tobacco. Surveys conducted from 1965 to 1990 found a drop in smoking rates among young people aged 15-19 years old. Twenty-one percent of both males and females in this age group were reported as smokers. This rate represented a decrease in smoking rates, over 25 years, in

young males of 34 percentage points (from 55% to 21%) and 16 percentage points in young females (from 37% to 21%). Smoking rates for the 15-19 age group have decreased more than any other age group since 1979. As part of the World Health Organization initiative, Health and Welfare Canada conducted a survey in 1989-90. King and Coles (1992) reported that this survey showed the progressive increase in the percentage of young smokers as they move into their teens. This trend was more marked in females than in males. The results showed that at age 11, 7% of boys and 5% of girls were occasional or regular smokers. By age 13, these figures had increased to 14% of males and 20% of females respectively. At age 15 these percentages reached 22% for males, and 29% for females. These findings demonstrated an increase in female smoking rates over males during the early teen years. The first time females in the 15-24 age group were smoking daily at a rate greater than their male counterparts occurred in 1989.

The Ontario Student Drug Use Survey conducted by Addiction Research Foundation found a 50% increase in tobacco use by Grade 7 students (12-13 years old) from 6.1% of students smoking in 1991 to 9.4% smoking in 1993 (Adlaf, Smart, & Walsh, 1993).

The extent of this problem became more concrete when the percentages were translated into actual numbers. In the United States alone, 3,000 children begin to use tobacco every day (Glynn et al., 1991), while in Canada it was estimated that in 1991 youth between the ages of 12 and 19, inclusive, spent more than $452,000,000 on cigarettes (National Clearinghouse, 1993).

Female Smoking Patterns

Every 35 minutes in Canada, a woman dies a preventable death due to smoking (Greaves, 1990). In the past, men of all ages have smoked more than women; however, in the last few years this trend has reversed (King & Coles, 1992). For the first time, significantly more adolescent girls than boys are smoking (Miller, 1992). In 1967, the year tobacco advertising aimed at selling specific brands to women was initiated, smoking initiation appeared to increase abruptly in females under 18 years (Haines, 1988). This finding implied that tobacco advertising targeted at females had affected younger females' initiation of smoking behaviours in response to the advertising initiatives (Covell, 1992).

A 1991 study by the Canadian Teachers' Federation reported that adolescent females tended to worry about relationships, social problems, violence, world issues, looks, and coping. As a group, adolescent females were found to have lower self-esteem than adolescent males (American Society of University Women, 1991). Most young females took up smoking to be like their peers, to look sophisticated and sexy, or to gain confidence (Canadian Teachers' Federation, 1991).

The health consequences from smoking for females were as great as or greater than those for males. In 1993, for the first time, lung cancer exceeded breast cancer as the leading cause of death for women (National Cancer Institute of Canada, 1992). Tobacco also affected women's reproductive systems (Bartecchi et al., 1994). Female smokers had a higher risk of cervical cancer, infertility, problems in pregnancy, menstrual disorders, and osteoporosis (U. S. Public Health Service, 1980). In addition, women who

smoked and took the Birth Control Pill were 5 to 10 times more likely to develop heart disease than those who took the Birth Control Pill and did not smoke (Chollat-Traquet, 1992). Therefore, it remains vital that smoking prevention programs recognize the unique needs of the female and that they are offered at an early age before initiation to smoking (Greaves, 1990).

Part D: Summary

A review of literature revealed that, while tobacco was the only legal substance that kills when used exactly as directed, adolescents continue to adopt smoking behaviours (Ontario Council on Smoking and Health, 1991). As well as being a negative implication on health, tobacco had also been identified as a "gateway drug" (Czechowicz, 1988; Eckhardt et al., 1994; Glynn et al., 1991; Torabi et al., 1993). An increase in the misuse of alcohol and drugs has been found to occur among youth who had previously initiated smoking (Kandel, 1975). Smoking trends identified an increase in smoking behaviours at both an earlier age and by females (King & Coles, 1992; Adlaf, Smart, & Walsh; 1993). This underscored the need for smoking prevention programs which have demonstrated success (Health Canada, 1994).

In 1989, both the Ontario Ministry of Education and the Ontario Ministry of Health mandated that smoking prevention programs be offered in schools. Under Ministry of Health guidelines, health departments in Ontario were required to deliver smoking prevention programs that used the social influence model (Mandatory Health Programs

and Service Guidelines, 1989). This model incorporated the social influence theory and social inoculation along with explicit teaching strategies to identify the role of social influence on smoking behaviours. Prevention programs embracing the social influence model have been shown to have an effect in reducing the onset of smoking in both high risk (smokers) and low risk (never smoked) students over time (Best et al., 1984; Flay et al., 1989). The 1993 National Survey on School Smoking Prevention Program looked at social influence smoking prevention programs throughout Canada. This survey found that the PAL program met most of the criteria of efficacy and recommended that this program be retained as a smoking prevention program in elementary schools. The Peer Assisted Learning (PAL) smoking prevention program used the social influence model along with peer leaders to increase students' knowledge, build resistance skills and to correct misperceptions related to tobacco use (Abernathy & Bertrand, 1992).

CHAPTER THREE: METHODOLOGY

Overview

The purpose of this research project was to determine the level of knowledge about tobacco and cigarette smoking among a sample of Grade 7 students. The level of knowledge was based on selected questions from the Grade 7 Lincoln County Board of Education Smoking Survey (Shaw Chudzik & Partington, 1994). Recognizing that there may have been extraneous sources of knowledge about tobacco, students who reported having had the PAL smoking prevention program were compared with students who reported not having had the PAL smoking prevention program during the 6th grade.

Research Design

A survey design was used comparing Grade 7 students who reported having had the PAL smoking prevention program in Grade 6 with their cohorts who did not participate in the PAL program.

Survey Tool

The Grade 7 Lincoln County Board of Education Smoking Survey (Shaw Chudzik & Partington, 1994) was used to collect the data. The questionnaire consisted of 38 questions which were answered with a letter, number, or short answer (Appendix B). The questionnaire sought to determine: demographic information, frequency of tobacco use, determinants of tobacco use, accessibility of cigarettes, origin of smoking-related information, awareness of the effects of social influence and knowledge related to tobacco use.

Data from the following questions were analysed for this study. Questions 1 and 2 identified the age and the gender of the subject. Questions 3, 4 and 6 sought to determine smoking behaviours including: if the students had ever tried smoking (including one puff), age when tried first cigarettes, and how many cigarettes usually smoked in one day. Questions 18 and 19 asked students about their source of tobacco-related information: where most of their smoking information was obtained and what, if any, smoking prevention program they had received. Questions 21 through 38 were knowledge-based questions. Knowledge-based questions contained content taught in the PAL program: addiction (Questions 21-22), laws related to tobacco use (Questions 23, 27, & 36), social aspects (Questions 24, 25, 31, 32, 35, & 37), long-term physical effects (Questions 23, 26, 30, & 34) and short-term physical effects (Questions 28, 29, & 33). Question 38 asked the students to name three things that could be done to refuse cigarettes.

Pilot Survey

The survey, consisting of 38 questions, was pilot tested in two Grade 7 classes of 22 and 23 Grade 7 students. The two schools were located in different geographic and socio-economic areas within the Lincoln County Board of Education. The purpose of the pilot test was to determine readability, clarity, and the amount of time that would be required to complete the questionnaire.

Problem areas were identified from the pilot testing and changes were made to the original survey and presentation script.

Selection of Participants

A total of 449 Grade 7 students from 19 schools in the Lincoln County Board of Education participated in this study. The sample represented approximately 32% of the 1,477 students functioning at the Grade 7 level in the Lincoln County Board of Education. All student respondents were between the ages of 12 and 13 years.

The Lincoln County Board of Education is a public school board with a total of 56 elementary schools in four geographic areas containing both urban and rural districts. A stratified random sample was used to select schools from each of the four geographic divisions within the Lincoln County Board of Education. In total, 19 Grade 7 classes from 19 schools were surveyed (see Appendix B). There was no follow-up for students who were absent on the day that the study was presented.

Procedure

After receiving permission from the Lincoln County Board of Education to conduct the study, "request to survey" letters were delivered to the principals of the selected schools within each area of the Board's jurisdiction (Appendix B). The trained public health nurses delivered the introductory letter which described the study outlining the rationale for the study and methodology of data collection. Any questions or concerns of the teachers were addressed at that time. After receiving approval from the principal, specific classroom teachers were approached and appointments were made to administer the survey to the students.

All subjects completed a self-report, finalized version of the questionnaire. In an attempt to overcome possible literacy problems, the questionnaires were read aloud by trained public health nurses using a standard script. The script identified the intent of the project, stressed confidentiality, and encouraged honesty in response (see Appendix B).

Field notes were written after the questionnaire was completed and the school name and number were written on the response forms. All of the questionnaires were administered by four trained public health nurses from the Niagara Regional Health Services Department in a six-week period. Attempts were made to ensure consistency of delivery and to reduce any possible influence by the teacher. The envelopes containing questionnaires responses were sealed.

All Grade 7 Lincoln County Board of Education Smoking Survey (Shaw Chudzik & Partington, 1994) data were manually transposed to "Scantron" computer readable cards

for the purpose of analyses. The scantrons were entered into a computer for statistical evaluation using the Statistical Analysis System (SAS) at Brock University (see Appendix B). The responses were used to assess the knowledge about tobacco in a sample of Grade 7 students.

The results of all findings were documented and a report submitted to the Niagara Regional Health Services and to the Lincoln County Board of Education.

CHAPTER FOUR: FINDINGS

The data were collected using the questionnaire in Appendix E. The data were analysed using the SAS to provide the following information: (1) descriptive statistics and (2) tests of hypothesis and assumptions. The level of knowledge was determined by summing the number of correct responses from the knowledge-based questions of the questionnaire (Appendix E), and by the use of the Scheffé test to compare mean scores across programs identified by use of a one-way ANOVA. The results were arranged in tables and graphs. Trends, patterns and statistical significance were identified within the results. The findings are presented in a logical format in relation to each of the research questions.

The present study was designed to determine if Grade 7 students, who received the PAL program for smoking prevention, had a greater knowledge about cigarette smoking than age-matched individuals who received either another smoking prevention program or did not receive any program. The distributions of participants separated by program and by gender are demonstrated in Figure 2. Table 1 presents the percent and frequency of correct answers by category and by gender. Table 2 presents the percent and frequency of correct answers by category of question and by type of program.

Considering that the dependent variable in this study was the number of correct responses to questions about cigarette smoking, the null hypothesis is stated as:

HO: $\bar{x}$ Knowledge score $_1$ = $\bar{x}$ Knowledge score $_2$ = $\bar{x}$ Knowledge score $_3$

1. PAL program 2. Other program 3. No program

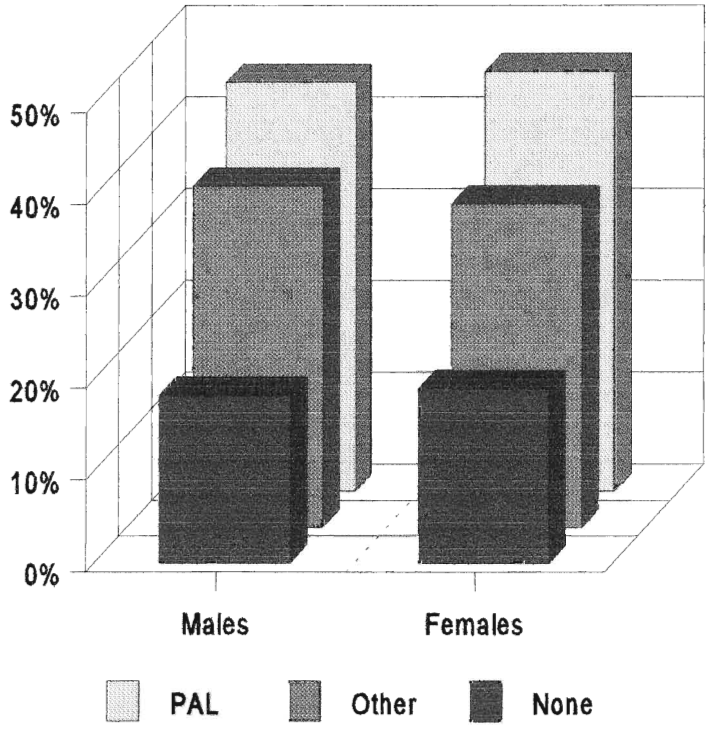

Figure 2 Distribution of participants by gender and by program

Table 1

Percent and Frequency of Correct Answers by Category of Question and by Gender

Question	Category	Male		Female	
		%	f	%	f
Smoking is form of drug use	addiction	92.0%	216	95.0%	201
Most smokers are not addicted	addiction	93.2%	220	95.3%	202
Smoking can cause heart attacks	long-term physical	95.3%	224	96.2%	204
Others' smoke can damage your health	social	95.3%	225	94.8%	201
Friends smoke, you are more likely to smoke	social	86.0%	202	79.0%	166
Smoking leading cause of death	long- term physical	80.7%	188	82.7%	172
Illegal under 18 to buy cigarettes	legal	91.5%	214	92.4%	195
Smoking is relaxing	short-term physical	61.6%	114	74.4%	154
One puff - heart beats faster	short-term physical	78.5%	183	83.9%	72
Only cancer caused by smoking is lung cancer	long- term physical	79.6%	187	82.2%	171
Glamorous, fun and sophisticated	social	92.8%	218	96.7%	204
More than 70% adults do not smoke	social	32.3%	75	20.9%	44
Reduces a person's athletic ability	short-term physical	91.0%	212	89.2%	189
During pregnancy harms the baby	long-term physical	97.9%	231	98.1%	206
Advertising influences smoking	social	91.9%	215	90.1%	191
Allowed in all public places	legal	91.0%	213	93.9%	199
Habit associated with certain activities	social	66.1%	152	68.0%	138

* f represents frequency

Table 2

Percent and Frequency of Correct Answers by Type of Program and by Category

Question	PAL	Other	None	Category
Smoking is form of drug use	95.4% f 188	94.0% f 147	89.0% f 73	addiction
Most smokers are not addicted	94.9% f 187	94.9% f 150	91.5% f 75	addiction
Smoking can cause heart attacks	95.5% f 189	94.3% f 149	98.8% f 80	long-term physical
Others' smoke can damage your health	94.9% f 188	94.9% f 150	95.1% f 78	social
Friends smoke, you are more likely to smoke	83.6% f 163	82.2% f 130	82.9% f 68	social
Smoking leading cause of death	80.7% f 155	85.4% f 134	76.8% f 63	long-term physical
Illegal under 18 to buy cigarettes	93.4% f 184	91.7% f 144	87.7% f 71	legal
Smoking is relaxing	72.4% f 142	67.3% f 105	56.1% f 43	short-term physical
One puff - heart beats faster	88.8% f 174	76.8% f 119	69.6% f 55	short-term physical
Only cancer caused by smoking is lung cancer	83.1% f 162	81.0% f 128	75.3% f 61	long-term physical
Glamorous, fun and sophisticated	94.4% f 186	98.1% f 154	87.8% f 72	social
More than 70% adults do not smoke	32.2% f 63	38.0% f 24.2	16.0% f 13	social
Reduces a person's athletic ability	89.8% f 177	89.9% f 142	91.4% f 74	short-term physical
During pregnancy harms the baby	99.0% f 185	96.8% f 153	97.6% f 80	long-term physical
Advertising influences smoking	93.9% f 185	88.0% f 139	92.6% f 75	social
Allowed in all public places	91.9% f 182	95.5% f 149	87.8% f 72	legal
Habit associated with certain activities	71.5% f 138	66.4% f 101	60.0% f 48	social

Type of Smoking Prevention Program

Not all respondents were part of the Grade 6 classes in the previous years. The results indicated in Figure 3 that approximately 81% of the students reported having received a smoking prevention program; 45% had received the PAL program, 37% had received another program, while 19% reported that they had not received any formal smoking prevention program.

The percentages of respondents recalling a formalized smoking prevention program, within the total group and across gender, are presented in Table 3.

Level of Knowledge Questions

A test of the research hypothesis indicated that there was a difference in tobacco-related knowledge scores between students who received the standardized smoking prevention program (PAL), students who received a nonstandardized smoking prevention program and students who did not receive any smoking prevention program. These findings are presented in Tables 4. Eighteen knowledge questions were divided into five categories: addiction, social, legal, long-term and short-term effects. The average number of correct responses are presented in Table 5. This table indicated that the scores ranged from 7 to 17. A one-way ANOVA, $F(2, 438) = 8.79$; $p < .0002$, average number of correct scores differed as a function of the three programs. Consequently, the Scheffé post hoc test was used to determine a better understanding of the nature of the significant difference. Table 6 demonstrates the results of the one-way analysis of

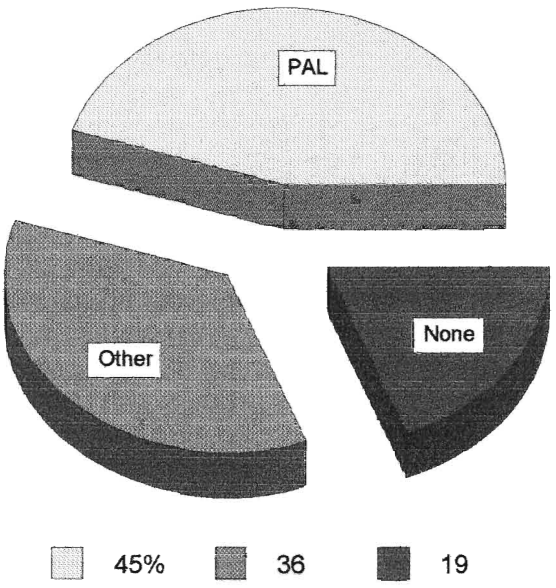

Figure 3 Distribution of participants in the study by program

Table 3

Frequency and Percent of Type of Smoking Prevention Program by Total Sample and by Gender

Sample	Type of Smoking Prevention Program					
	PAL		Other		None	
	f	%	f	%	f	%
Total	198	45%	159	36%	82	19%
Males	102	45%	85	37%	42	18%
Females	96	46%	74	35%	40	19%

Frequency of nonrespondents to this question - males 8, females 2

Table 4

Correct Knowledge Scores by Type of Program

	Type of Program		
	PAL	Other	None
Mean Number of Correct Answers	14	14	13
Standard Deviation	+/- 1.6	+/- 1.9	+/- 2
Lowest Score	7	8	7
Highest Score	17	17	17

Knowledge Score for PAL = Knowledge Score Other = Knowledge Score for None

$\bar{X}$ = 14 +/−1.6 $\bar{X}$ = 14 +/−1.9 $\bar{X}$ = 13 +/−2

Table 5

Frequency and Percent of Correct Knowledge Base Questions by Gender

	Males		Females	
Number of correct answers	f	%	f	%
7	_	_	2	0.4
8	3	0.7	1	0.2
9	4	0.9	_	_
10	6	1.3	3	0.7
11	8	1.8	5	1.1
12	22	4.9	14	3.1
13	36	8.0	34	7.6
14	45	10.0	60	13.3
15	54	12.0	44	9.8
16	50	11.1	41	9.1
17	8	1.8	8	1.8

Note: Maximum score 17

Mean score for males and females 14

Standard deviation: males 2.1, females 1.7

Table 6

One-Way Analysis of Variance to Compare Means Across the Three Programs for Knowledge Scores: Scheffé Test

Type of Program	Mean	Mean Difference	Critical Difference	Significant
PAL	14.49 $\bar{x}1$			
Other	14.03 $\bar{x}2$	0.41	0.50	NO
PAL	14.49 $\bar{x}1$			
None	13.42 $\bar{x}3$	1.02	0.59	YES
Other	14.03 $\bar{x}2$			
None	13.42 $\bar{x}3$	0.61	0.61	NO

Note. Scheffé's Test : If the Mean Difference is greater than the Critical Difference the means are significantly different.

Therefore, Knowledge Score $\bar{x}1$ = Knowledge Score $\bar{x}2$ ≠ Knowledge Score $\bar{x}$ 3

variance for comparison of means across the three groups. The PAL program was found to produce a statistically significant increase in tobacco-related knowledge compared to the no program group. However, PAL students did not have more knowledge about tobacco use than students who had been in other smoking programs.

Responses by Type of Question

In the addiction category there were two questions: "Smoking cigarettes is a form of drug use," and "Most smokers are not addicted." The results indicated that females differed from males in the number of correct answers. More females answered these questions correctly. Likewise, PAL program participants were more likely to answer these questions correctly.

In the social category there were six questions related to secondhand smoke, peer pressure, misperceptions of appearance and extent of smoking behaviours, the number of smokers, the role of advertising and the habituation of smoking. The results indicated that males differed from females on the number of correct answers. More males answered these questions correctly. Likewise, there was a difference in the responses to the six questions of the social category across all three programs. The smoking prevention program groups answered five questions correctly. The no smoking prevention group answered the question about secondhand smoke correctly most often.

Questions related to the legal aspects of tobacco use, and the long-term and short-term physical effects of smoking were answered more correctly by females, regardless of the type of smoking prevention programs. The question that received the fewest correct

answers was "More than 70% of Canadian adults do not smoke."

One question went beyond knowledge to application of refusal skills. Students were required to generate their own written answer "naming three things you can do to refuse cigarettes." This question was answered correctly more often by females and students who received PAL as shown in Table 7.

Origin of Knowledge

Another important question related to where students obtained most of their smoking information; almost 60% of total respondents answered school. The remaining responses occurred in descending order: media, home, and friends. Comparison of where students report getting most of their smoking by total sample and by gender are presented in Table 8.

Reasons Given for Choosing Not to Smoke

One of the very important questions asked in this study was: "If you are a non-smoker why did you choose not to smoke?" The data indicate that a greater proportion of males were more concerned with the cost of cigarettes. Other noticeable differences between males and females for reasons they chose not to smoke included sports (males 59%, females 32%) and addiction (males 51%, females 64%). Health was identified most frequently by males and females; however, more females (83.5%) than males (78.5%) identified this as more important. Other reasons included "cigarettes are

Table 7

Three Things You Can Do to Refuse Cigarettes by Program

# Answer	Type of Smoking Prevention Program					
	PAL		Other		None	
	f	%	f	%	f	%
3 correct	146	74%	103	66%	48	61%
2 correct	42	21%	43	27%	20	25%
1 correct	7	4%	11	7%	8	10%
0 correct	1	1%	--	--	3	4%

Note: Students generated their own written answers. This question went beyond knowledge to application.

Table 8

Where Do You Get Most of Your Smoking Information?

Sample	Friend		Home		School		Media	
	f	%	f	%	f	%	f	%
Total	40	11%	53	14%	220	59%	62	16%
Males	21	10%	31	15%	115	57%	34	17%
Females	19	11%	22	13%	105	60%	28	16%

Frequency of nonrespondents to this question: total 74, males 36, females 38

illegal," parental influence, and unpleasant taste and smell (all equally reported by males and females). The results also showed that the PAL group provided more reasons not to smoke. Table 9 compares the nine reasons not to smoke by type of smoking prevention program.

Smoking Behaviours

The data were collected to determine smoking behaviours. Using the questions about trying smoking provided information about who was experimenting with cigarette smoking and which students reported smoking on a daily basis. Data were collected for the total sample 449 (100%) students. The data indicated that 36% (164) of students answered "yes" to having tried smoking (42.2% of males and 30.2% of females).

Cross-tabulations were used to compare the relationship between smoking behaviours and the type of smoking prevention programs the students received. Although difference in percentages observed across or between categories were not significant, important considerations about these data are presented in Table 10 and 11. Of males who had received PAL, 43% had tried smoking versus 38% of "other smoking prevention programs," and 67% who had not received a smoking prevention program. The percent of females who indicated that they had tried smoking were 30% of PAL, 34% of "other smoking prevention programs" and 25% of those who had no smoking prevention program. It is important to recognize that 63% (124) of the "never tried smoking group" were PAL, 65% (103) were "other" programs and 56% (46) were those who did not receive a smoking prevention program.

Table 9

Frequency and Percent of Reported Reasons for Choosing Not to Smoke by Type of Smoking Prevention Program

Reason chosen	Type of Smoking Prevention Program					
	PAL		Other		None	
	f	%	f	%	f	%
cost	99	52.9%	63	42.0%	30	41.1%
appearance	105	44.1%	61	40.9%	29	40.3%
illegal	77	41.0%	57	38.3%	23	31.5%
parent	106	56.4%	73	49.0%	28	38.4%
sport	94	50.3%	62	41.6%	28	38.4%
addiction	97	51.6%	66	44.3%	33	45.8%
health	159	84.6%	118	79.2%	54	75.0%
unpleasant taste & smell	124	66.0%	83	55.7%	46	63.9%
other	41	21.8%	35	23.5%	13	18.1%

Table 10

Frequency and Percent of Males Who Tried Smoking Cigarettes, Including One Puff, Classified by Type of Smoking Prevention Program Received

	Type of Smoking Prevention Program					
Age at onset	PAL		Other		None	
	f	%	f	%	f	%
8 years and under	12	5.3%	6	2.7%	6	2.7%
9 to 10 years	7	3.1%	6	2.7%	8	3.6%
11 years and over	23	10.2%	16	7.1%	14	6.2%

Frequency of nonrespondents to this question = 12

Table 11

Frequency and Percent of Females Who Tried Smoking Cigarettes, Including One Puff , Classified by Type of Smoking Prevention Program Received

	Type of Smoking Prevention Program					
Age at onset	PAL		Other		None	
	f	%	f	%	f	%
8 years and under	2	1%	3	1%	--	--
9 to 10 years	7	3%	4	2%	1	1%
11 years and beyond	20	10%	18	9%	9	4%

Frequency of nonrespondents to this question = 2

Of the males who tried smoking before the age of eight, 50% had PAL, 25% had "other" programs and 25% had no program. Of the females who tried smoking before age eight, 40% had PAL and 60% had another program. No students reported "not having a smoking prevention program," and "trying smoking," under eight years of age.

It is important to compare percent values across groups. Table 12 compares three age groups by "ever trying cigarettes" by "smoking prevention program," and by "gender." More females reported trying cigarettes after age 11. It is also important to note that more of the PAL program students reported trying smoking, compared to students who received the "other" smoking prevention program.

Extent of Cigarette Smoking by Adolescents

The extent of the smoking behaviours in this sample was determined from the reports of the number of cigarettes smoked in one day. The intent of this question was to separate the students who experimented with smoking from the individuals who were daily smokers. Table 13 compares the three categories of cigarette smoking per day (none, less than three, and three and over) with the type of smoking prevention program. Data on the type of smoking prevention program and the number of cigarettes usually smoked in one day are reported in Appendix G. The results indicated that there were more nonsmokers among the students who received either a PAL or "other"smoking prevention program, than those who did not receive any program.

Students who did not receive a smoking prevention program smoked more cigarettes per day. The smoking category was analysed by type of smoking prevention program:

Table 12

Smoking Behaviours by Type of Smoking Prevention and Gender

Sample	Type of Smoking Prevention Program					
	PAL		Other		None	
	Never tried	Tried	Never tried	Tried	Never tried	Tried
Total	63%	37%	65%	35%	56%	44%
Males	57%	43%	67%	33%	33%	67%
Females	70%	30%	66%	34%	75%	25%

Table 13

Frequency and Percent of Number of Reported Cigarettes Smoked in One Day by Type of Smoking Prevention Program Received

Number of cigarettes usually smoked/daily	Type of Smoking Prevention Program					
	PAL	n = 196	Other	n = 157	None	n = 82
	f	%	f	%	f	%
none	174	89%	143	91%	65	79%
less than 3	16	8%	11	7%	11	13%
3 and over	6	3%	3	2%	6	7%

Note: at the level of 3 and over cigarettes per day the issue of addiction is considered.

Frequency of nonrespondents to this question = PAL 2, Other 2.

Students who did not receive a smoking prevention program reported smoking at a rate of 20% compared to those who had smoking prevention programs (11% PAL; 9% other program).

Considering that six or more cigarettes per day is an indication of heavy smoking, in the present study, 4.3% (15) of the total group reported smoking three or more cigarettes in one day (equally represented by males and females). Students who did not receive a smoking prevention program also reported smoking a greater number of cigarettes per day; 7% smoked six or more cigarettes per day. Respondents who received smoking prevention programs did not report smoking six or more cigarettes per day.

CHAPTER FIVE: DISCUSSION

According to Pentz (1983), substance use first occurs in early adolescence, usually about Grades 6 and 7. The core for Personal and Social Studies: Self and Society (1995) which is within the Common Curriculum, is not only targeted to the Grade 6 student but includes a section on lifestyle choices that are related to tobacco use. As described earlier, the purpose of the Personal and Social Studies: Self and Society program is to increase the level of understanding among students in Grades 6 about issues related to tobacco and other substance use. Evaluating the level of knowledge of participants in the Self and Society Program one year later was intended to be a simple approach to evaluating the effectiveness of the PAL program. The results of the present study indicated there was a significant difference in knowledge related to tobacco between students who had PAL versus students who had not had a smoking prevention program. The PAL students had a greater tobacco-related knowledge than their cohorts who had not had a smoking prevention program.

To identify educational backgrounds related to the topic of tobacco use, students were asked if they had received any formal instruction on smoking prevention. Recognizing that if these classes were offered, the smoking prevention program it would have occurred one year ago and the students might not have identified the program as PAL. A script was used in conjunction with the survey which described the PAL

program and any "other" smoking prevention program. A copy of the script is included in Appendix C. When the distribution between the PAL program and the "other" programs were compared, there was a possibility that there may have been greater percentages of students who actually received PAL but did not recognize the name of the program. Not all respondents were part of the Grade 6 classes in the previous year that had received the PAL program. The rate of individuals reporting no formalized smoking prevention program may be reflective of the low impact of the smoking prevention program on the students.

All three program groups were trying cigarettes and the incidence increased with age. It is somewhat encouraging that 88% of the total group reported not smoking daily but it also makes teachers and health professionals aware that more smoking prevention initiatives must be ongoing to help students remain nonsmokers. Males who had the PAL program reported smoking behaviours at a higher percentage than those who had another program, while females reported a higher percentage of smoking behaviours than those who reported having no smoking prevention program.

Across programs, daily smoking rates of students age 11 and older students who had not had a smoking prevention program reported smoking behaviours at twice the percentage of those who had a smoking prevention program. Both males and females who received PAL reported that they had tried cigarettes at age 11 and over. It may be that students who had smoking prevention programs were sensitized to the issue and more willing to answer honestly. These findings may reflect a higher smoking rate than those of the Ontario Student Drug Use Survey 1977-1993 which reported an increase in

smoking rates in Grade 7 students up from 6.1% to 9.4% (Adlaf et al., 1993).

Females who had a PAL program had an increased incidence of trying smoking from 1% at age 8 years and under to 10% at age 11 and beyond. These findings report increased smoking rates among females with age and may support a documented increase trend in female smokers (Greaves, 1990). Greaves' (1990) research on female smoking trends to date have focused on females 15 years and beyond. The findings in this study suggest that the trend may start earlier than 15 years of age.

When asked about trying smoking, students who did not receive a smoking prevention program reported considerably higher percentage of cigarette smoking per day. At the level of three or more cigarettes per day the issue of nicotine addiction is considered. The 1994 Council for a Tobacco-Free Ontario, Grade 6 kit: Who me? Yes, I'm Smoke-free (p. 16) resource sheet for teachers addressed the issue of the amount smoked and addiction. This resource sheet stated that depending on an individual's metabolism, it could take less than five cigarettes to addict a teenager to nicotine. This program stressed that there was no safe level of tobacco use (Council for a Tobacco-Free Ontario, 1994).

Along with addiction, another important issue related to the number of cigarettes smoked per day by teenagers is the short-term and long-term physical effects of cigarette smoking. Bartecchi et al. (1994) stated that the expected risk of illness and death was directly proportional to the duration and the amount smoked. As mentioned previously, the WHO stated that control of cigarette smoking could do more to improve health than any other single action in the field of preventive medicine. The role of smoking

prevention is underscored in adolescents since the expected risk of illness and death related to cigarette smoking is directly proportional to the duration and the amount smoked. There have been two major changes in smoking patterns in Canadian youth; they are beginning to smoke at an earlier age (11 years), and there has been an increase in female smoking rates (Adlaf et al., 1993). The addictive nature of cigarette smoking and its effect as a "gateway drug" enhance the need for effective smoking prevention programming offered in schools.

In program planning and delivery it is important to determine where adolescents report that they get most of their information about smoking. In this study the highest percentage answered that the source of most of their information about smoking came from school. This is an important finding since most smoking prevention programs take place in schools and gives support for enhancing the extent of evaluated smoking prevention programs. Following a national survey evaluating school-based smoking prevention programs, Health Canada has recommended that emphasis be placed on ensuring effective implementation of the best smoking prevention programs rather than developing new social influence programs. The PAL program was recommended by Health Canada based on its curriculum satisfying the majority of the program evaluation criteria. Deficiencies in this program were identified and recommendations for appropriate actions to address these weak points were provided. The national survey did not evaluate the effects of smoking prevention programs in the increase of tobacco-related knowledge. The results of this study compliment those of earlier studies related to smoking prevention programs.

The Social Influence Model identified peers, relatives, and media as sources of pressure related to smoking behaviours. The lower response rate to these perceived sources of tobacco-related information also suggests that a greater emphasis should be placed on smoking prevention programming as part of the curriculum. These findings are interesting since Elkind (1978) identified a decline in parental influence with respect to lifestyles at the same time that a reliance on peer groups increased. In this study both males and females reported home as a greater source of smoking information than friends.

An effective curriculum has been based on a recognized learning theory. The model of knowledge construction supports the transfer of knowledge from short-term to long-term memory as a process to increasing knowledge. The significant difference in the knowledge levels of those students who received PAL versus those students who did not receive PAL in the present study supports the use of PAL in developing an effective smoking prevention curriculum. Through interactive group discussion, drama structures, visual art and role playing, students call on prior knowledge to evaluate and adopt new teachings thereby enhancing knowledge on the topic. Standardized smoking prevention programs such as the PAL program may be able to increase an individual's level of understanding and knowledge about an outcome of tobacco use.

The extent of prior knowledge construction related to tobacco students used was evaluated by the number of correct answers provided to questions of a survey. Knowledge construction based on number of correct answers was considerably lower in the group that did not receive a smoking prevention program group versus those who had

prevention programming. It is expected that by increasing an adolescent's knowledge about tobacco use he/she will be able to incorporate this knowledge into his/her decision-making process and subsequently remain or become a nonsmoker.

Implications

Smoking among adolescents is a serious problem. Educators and health professionals can have a positive impact on children who are at risk of initiation of smoking behaviours in the future. The burden of smoking-related diseases can be reduced through smoking prevention programs. These programs are most effective when presented in early adolescence when students are better able to learn new information when they do not have wrong information cluttering up their schemata.

Given the fact that tobacco related education is mandated for both Boards of Education and Public Health Units, there already exists an avenue of opportunity for effective program delivery. Teachers and Public Health nurses should be made aware of these findings by means of professional publications and research journals. School Boards and Health Units should offer inservice education to professionals on social influence smoking prevention programs such as PAL.

Conclusion

Given the enormous health care costs, both personal and financial, related tobacco

use and the increasing rate of young adolescent smokers, especially females, it is necessary for educational and health sectors to evaluate currently implemented strategies in smoking prevention. There is an abundance of data suggesting that tobacco is addictive, acts as a gateway drug, and has profound negative physical effects. Findings such as these have resulted in the recognition of the role of prevention programming in increasing knowledge but not necessarily in behavioural outcomes. There has been a great deal of research to address the issue of the most effective pedagogical method to achieve this goal. The PAL program has been recommended by Health Canada. There are gaps in this program that need to be addressed and resources developed to meet identified needs.

Recommendations

The following recommendations are being made based on the findings:

1. Boards of Education should survey teachers to determine what type of smoking prevention program is presently being offered.
2. Effective classroom smoking prevention programs should include follow-up (booster classes) within the same year and future years.
3. Teachers and public health nurses are the key figures for program delivery in the classroom. It is important to motivate and to provide training and resources to support this group.
4. The public health nurse, the teacher and the students should work together to

create a year-long smoking prevention program in the school.

5. Females and males remain nonsmokers for different reasons. Recognition of theses differences require that different resources be made readily available to respond to identified areas of interest.
6. Given the increasing trend of female smokers, smoking prevention programs should be adapted to address the needs of young women.
7. With the introduction of Bill 119 which prohibits smoking on school property, there should be involvement of the community in the support of smoking policy and in the coordination of local events concerned with tobacco use.

CHAPTER SIX: SYNOPSIS

The purpose of this research study was to determine if there was a difference in knowledge related to tobacco use in students who received a standardized smoking prevention program (PAL) versus students who received either a nonstandardized smoking prevention program or no program at all. A one-way ANOVA and the Scheffé test were used to test the statistically significant difference between students who had the PAL smoking prevention program and those who received no smoking prevention program. Results were also analysed by reporting percents. This research study produced the following findings:

1. Students who had the PAL smoking prevention program had a significantly higher knowledge related to smoking versus those who had no smoking prevention program.
2. 34.2% of subjects in the PAL group responded correctly to the knowledge-based questions at a rate that was equal to or greater than the mean versus 24.8% for the "other" program group and 10% for the no program group.
3. 19% of total subjects reported having received no smoking prevention program.
4. 36.6% of the total sample had tried smoking, including one puff.
5. 43.9% of the no smoking prevention program group reported they tried smoking.
6. The incidence of tried smoking increased with age.

7. More females and more of the PAL group reported trying smoking.
8. 88.1% of subjects reported smoking no cigarettes per day.
9. Subjects in the no smoking prevention program group smoked more cigarettes per day versus the groups who had smoking prevention programs.
10. 6.1% of the no smoking prevention program group smoked six and over cigarettes a day versus 0% for smoking prevention programs.
11. There were noticeable differences in reasons given for choosing not to smoke between males and females. Health was the most common response.
12. Subjects in the PAL group had more reasons available to them for choosing not to smoke.
13. 60% of total respondents answered that they obtained most of their smoking information from school.

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Appendix A: Tables of Smoking Prevention Programs

SMOKING PREVENTION PROGRAMS

TITLE	TARGET	SOCIAL INFLUENCE	COST	TAUGHT BY	FOCUS	EVALUATED
American Cancer Society ACS	Pre-school - Grade 12	Yes	N	T	substance use including tobacco in preschool, elementary, junior high and high school	Y
Project CLASP Counselling leadership About Smoking Pressure	Grade 7	Yes	N	T/P	social inoculation, communication, increase social commitment, resistance skills, peer leaders, role playing	Y
GROW HEALTHY	K - 7	No	Y	T	self-esteem and decision making aimed at healthy attitude/behaviours	N
KNOW YOUR BODY	K - 7	No	N	T	skills & knowledge for positive health decisions	N
LIFE SKILLS TRAINING, LST	Grades 7-8-9	Yes	Y	T	skills to resist direct/indirect pressure & positive health beliefs	Y
MINNESOTA SMOKING PREVENTION,MSSP	Grades 7 - 9	Yes	Y	T/P	corrects misperceptions, teachers resistance skills, & counter arguments	Y
PEER ASSISTED LEARNING, PAL	ages 11- 13	Yes	Y	T/P	focus on the positive aspects on non smoking, fosters non smoking attitudes/beliefs, peer leaders, role playing	Y
Project PATH Program to Advance Teen health	Grades 6-12	Yes	Y	T	tobacco-related curriculum teaches harmful effects of cigarettes & use of refusal skills	N
Project Smart	Grades 6-7	Yes	Y	T	social pressure & resistance to smoking, alcohol & marijuana	N
TOWARDS NO TOBACCO, TNT	Grade 7	Yes	N	T	counteract normative social influence, misconception & lack of knowledge	Y

TITLE	TARGET	SOCIAL INFLUENCE	COST	TAUGHT BY	FOCUS	EVALUATED
RISK & YOUTH: SMOKING, RAY:S	grades 6-8	No	Y	T	emphasis; smokers lose some control over life, maintain smoke free friends	N
SKILLS FOR ADOLESCENCE LION'S QUEST	Grades 6-8	No	N	T	responsibility, decision making, communication, self-confidence, goal setting skills	Y
SMOKING PREVENTION TRAINING	Grades 4-6	Yes	Y	T	resistance skills, coping with pressures, positive alternate activities to smoking	N
Stop, Options, Decide, Act, Self-Praise, SODAS	Grade 6	No	N	T	social skills training, behavioural rehearsal, role playing, focus on self-control and self-reward	Y
Project SHOUT Students helping Others to Understand Tobacco	Grade 7	Yes	Y	T/P	health hazard of smoking and smokeless tobacco, resist peer pressure, used effectively with high risk students	Y
University of Vermont-Smoking Prevention	Grades 5-10	Yes	Y	T	curriculum per grade level resist pressure, decision making, refusal skills, stress management	N
WATERLOO SMOKING PREVENTION	Grades 6-8	Yes	N	T/p	social consequences of smoking, peer pressure. Information on how to help others to stop smoking	Y

Y - yes
N - no
T - teacher
P - peer leader

School Smoking Prevention Programs: A National Survey (1994)

Criteria	Smoking Prevention Program		
	PAL	Quest	Lungs are for Life
Focus			
tobacco use prevention focus	X	✓	✓
integrated in curriculum	X	✓	✓
Content			
health consequences	✓	✓	✓
social consequences	✓	✓	✓
influences to smoke	✓	✓	✓
decision-making/problem-solving	✓	✓	✓
resisting pressure to use tobacco	✓	✓	✓
Delivery			
interactive instruction techniques	✓	✓	✓
parental involvement	✓	✓	✓
modelling of tobacco-resistance behaviours	✓	✓	✓
rehearsal or role-playing of resistance behaviours	✓	✓	X
public commitment	✓	✓	X
timing (prior to age when uptake of tobacco is highest-Grade 6)	✓	✓	✓
distribution of learning	X	✓	✓
uses teachers-led peer assistant	✓	✓	X
Implementation and Adoption			
teacher training offered	✓	✓	✓
school policy	✓	X	X
co-ordinate with community events	✓	✓	X
program, organized and clear	✓	✓	✓
suggests adaption for specific needs	X	X	X
suggests adaption for gender	X	X	X
consistent with provincial/territorial guidelines	↔	↔	↔
marketing and distribution strategy	✓	✓	✓
evaluation	✓	✓	X
long-term collaborative efforts using other strategies (laws)	✓	✓	✓

✓ refers to criteria met; X refers to criteria not met; ↔ refers to unable to judge criteria

Appendix B: Review of PAL

The Peer Assisted Learning (PAL) Smoking Prevention Program

In the early 1980s the Health Promotion Directorate of Health and Welfare Canada introduced the Peer Assisted Learning Smoking Prevention Program (PAL). This program was and still is an integral part of its "Towards a Generation of Non-Smokers" initiative. The PAL smoking prevention program uses a social influence approach to "give students the knowledge and skills to resist pressure to smoke" (A Peer-Assisted Learning Resource, 1986). This program is used extensively throughout Canada.

The PAL smoking prevention program employs explicit teaching and active learning techniques to retrieve students' prior knowledge. Issues such as inaccurate normative expectations are explored by means of interactive group discussion. Peer-led discussion and group activities result in peers helping peers to obtain accurate knowledge and the interpersonal skills to resist peer pressure to smoke.

The PAL smoking prevention program consists of eight 45-minute sessions offered in Grade 6 with optional booster programs for Grade 7 and 8. Teaching strategies include: peer interactive discussion, drama structures, visual art, and classroom presentations. The social influence model provided the theoretical base for each sessions.

Session One examines the immediate and cumulative (short- and long-term) effects of smoking. The goal of this session is to enhance awareness of the issue and provide rationale behind remaining or becoming a nonsmoker. Students survey both smokers and

nonsmokers to determine the prevalence of smoking behaviours and to develop profiles of smokers and nonsmokers.

The second session addresses the problem of addiction. Students discuss the difficulties experienced by smokers when they are quitting smoking. Through these discussions students are made aware of the extent and the seriousness of nicotine addiction.

The third session explores peer pressure. Peer-led discussion looks at the reasons adolescents smoke and analyses three types of pressure: direct, indirect, and insistent. The impact of these three social pressures is experienced by means of role playing.

Social inoculation is initiated in the fourth session. Students are exposed to social pro-smoking influences in order to provide them with the opportunity to practice saying "no." This process prepares them to develop a resistance level against future exposure. Each student invents his or her own way to resist social influence to smoke. They then have an opportunity to practice their new social influence resistance skills through drama structures. Music is often used in this session by encouraging the writing of a rap song containing the "say no" message.

The role that media plays in cigarette advertising is discussed in Session Five. Students are made more critically aware of how smoking is presented and promoted through media. The influence of this pressure is exposed within the social influence theory. Visual art strategies are employed in which smoke-free advertisements are produced that counter media's pro-smoking message.

Session Six promotes the concept of positive peer support for the nonsmoker through

teaching the effects of secondhand smoke. Using the social influence model, students develop and rehearse ways of requesting a smoke-free environment through role playing.

The difficulties of sticking with a decision in general, and remaining smoke-free, in particular are examined. In the seventh session peer-led group discussion assists fellow peers to identify approaches to overcome possible obstacles to maintaining a decision. Skits are used to help incorporate insights and techniques for responding to negative social influences while reinforcing a decision to remain smoke-free.

A review and chance to talk about personal experiences is offered in the eight PAL sessions. Students have the opportunity to rehearse and to consolidate these new concepts into their long-term memory.

Optional boosters are available for Grades 7 and 8 in which students review the concepts and refusal skills taught in the PAL smoking prevention program.

CLASS: GRADE SIX CLASSES
TIME: EACH SESSION IS 45 MINUTES
THEORY: THE SOCIAL INFLUENCE MODEL

SESSION	FOCUS	STRATEGY
1	short- & long-term effects of smoking, enhance awareness of issues related to smoking	students survey a smoker & a nonsmoker
2	discuss addiction in general & how it relates to nicotine in particular	-interactive group discussion -peer leader
3	peer pressure; direct, indirect, & insistent	-role playing -rehearsal
4	social inoculation, exposure to pro-smoking pressure to assist the student to learn to say "no"	-music "rap" -drama structures
5	critical awareness of the role of media in advertising cigarettes	group discussion - visual art
6	effects of secondhand smoke, request a smoke-free environment	peer leaders -role playing
7	decision-making skills and coping strategies to become or remain a nonsmoker	interactive group discussion -skits
8	review, rehearse, consolidate new concepts of PAL into a smoke-free lifestyle	sharing of experiences -transfer to long-term memory

BOOSTERS: Optional offered in Grade/s Seven and/or Eight and acts as a review calling on long-term memory.

APPENDIX C: BACKGROUND OF THE STUDY

THE REGIONAL MUNICIPALITY OF NIAGARA

MEMORANDUM

DATE: January 28, 1994

TO: School Survey Development Committee

FROM: Karen Chudzik

SUBJECT: **Meeting: Monday, February 7/94**
1:00 - 2:30 PM Meeting Room #1

Attached please find background material for survey development. This material will be covered in stages as we determine the focus of our survey and the corresponding timelines.

February 7th meeting will be brainstorming around PALS program and how we can determine the effect it has had on our target group. The goal is to develop and distribute a survey in the schools prior to the school year ending.

Please make an effort to read the Evolution of Evaluation.

Thanks,

Karen

cc: Sandra Rifat
Betty Manson
Harvey Hagerty
Betsy Partington
Nancy O'Neill
School Program Manager

pals.fcb

SCHOOL SURVEY DEVELOPMENT COMMITTEE
MINUTES

Date: March 2, 1994

Present: Sandra Rifat, Betty Manson, Betsy Partington, Nancy O'Neill, Karen Chudzik
Regrets: Harvie Hagerty

AGENDA ITEM	ISSUE DISCUSSION	ACTION	PERSON RESPONSIBLE
Review of draft survey	survey reviewed question by question	multiple changes made to survey question	Karen to have survey changed as directed and to provide new survey for next meeting
Administration of survey	- discussed reading the questions aloud in the classroom - the pro and cons of one or two individuals administering the survey verses multiple administrators to maintain quality control and consistency - notes to be made re any event that may have an effect on the response to the survey ie. fire drill - debriefing of students post survey with the provision of the correct answers to quiz - this may be done by teacher in lesson form - script to be developed and training of adminster/s to assure quality and consistence of delivery	further discussion to occur in upcoming meetings of the committee	committee as a whole
Ethics committee	survey to be sent to an ethics committee for approval prior to piloting of survey	discussed going through Brock's Ethics Committee	Sandra to explore options

NEXT MEETING: MONDAY, MARCH 7, 1994 MEETING ROOM #1

NUMBER OF GRADE 7 CLASSES IN LCBE 1994

Statistics provided by Betsy Partington, March 11,94

- 29 Grade 7 classes (1477)

  - does not include split classes
  - does not include special education

- 6 of the 29 classes are French Emersion
  - Dalewood 2 classes (41 students)
  - Lakeview 1 class (26 students)
  - Oakridge 2 classes (49 students)
  - Queen Mary 1 class (22 students)

* contact at the Board - Audrey, Planning Department

THE REGIONAL MUNICIPALITY OF NIAGARA

MEMORANDUM

DATE: March 16, 1994

TO: Harvie Hagerty, Consultant

FROM: Karen Chudzik

SUBJECT: **PALS Program offered in LCBE 1993**

My records show that the PAL six week smoking prevention program was provided by Public Health Nurses in the following Lincoln County Board of Education schools during 1993:

Applewood
Briardale
Connaught
Consolidated
Edith Cavell
Grapeview
Lakebreeze
Lincoln Centennial
Maple Crest
Maywood
Meadowvale
Orchard Park
Parnall
Pine Grove
Prince Philip
Victoria

If there were additional teacher driven PAL programs or other smoking prevention programs offered during this time period I have no records of them. If you are aware of any please let me know.

cc: Survey Committee Members
Betty Manson
Betsy Partington
Nancy O'Neill
Sandra Rifat

Regional NIAGARA

HEALTH SERVICES DEPARTMENT

Office of The Medical Officer of Health
573 Glenridge Avenue, P.O. Box 3040
St. Catharines, Ontario L2R 7E3
Telephone: (905) 688-3762
Toll Free: 1-800-263-7248 FAX (905) 682-3901

April 7, 1994

Harvie Hagerty,
Coordinator Physical Education & Health
Lincoln County Board of Education
191 Carlton Street
St. Catharines, Ontario
L2R 1S1

Dear Harvie:

Re: PAL Smoking Prevention Evaluation
Survey for Grade 7

The survey is now complete. The Public Health Nurses to deliver the surveys are Betsy Partington, Nancy O'Neill and myself. It will be delivered to one grade seven class in each of twelve randomly chosen Lincoln Public schools.

The student sample represents approximately twenty percent of our target group and will include two french immersion classes. The schools to be surveyed are:

College Street
Gainsborough
Vineland
Burleigh Hill
Ferndale
Woodland
Dalewood (french immersion)
Queen Mary (french immersion)
Sheridan Park
Carlton
Port Weller
Scottlea

If you approve of the survey please sign and forward the attached letter to the above principals. Please inform us as soon as the letter has been delivered and the nurse will then contact the school's principal and make necessary arrangements. ***Our goal is to complete this evaluation survey within a month.***

We appreciate your collaborative efforts in evaluating this health promotion curriculum and thank you in advance for your prompt attention.

Yours sincerely,

Karen Chudzik, R.N., B.Sc.N.
Health Promoter
Tobacco Use Prevention

Second Round at Random Sampling of L.C.B.E. Schools

June 2, 1994

Area 1	Vineland	-	first round
	Nelles	-	no Grade 7
	Senator Gibson	-	no Grade 7
	Maple Grove	-	no Grade 7
*	Caistor Central	-	second round
*	Grand Ave	-	second round
Area 2	Oakridge	-	first round
	Power Glen	-	no Grade 7
	Applewood	-	no Grade 7
	Ferndale	-	pilot
*	Westdale	-	second round
	Maple Crest	-	no Grade 7
	Burleigh Hill	-	first round
	Glen Ridge	-	no Grade 7
	Consolidated	-	no Grade 7
*	Grapeview	-	second round

Second Round at Random Sampling of L.C.B.E. Schools

June 2, 1994

Area 3

	Maywood	-	no Grade 7
	Orchard Park	-	no Grade 7
*	Dalewood	-	second round
	Meadowdale	-	no Grade 7

Area 4

	Lockview	-	no Grade 7
*	Connaught	-	second round
	Maplewood	-	no Grade 7
	Carlton	-	first round
	Port Weller	-	first round
	Lincoln Centennial	-	no Grade 7
	Mc Culley	-	no Grade 7
	Laura Secord	-	no Grade 7
*	Virgil	-	second round

APPENDIX U. PILOT STUDY

THE REGIONAL MUNICIPALITY OF NIAGARA

MEMORANDUM

DATE: March 16, 1994

TO: Smoking Survey Committee Members

FROM: Karen

SUBJECT: **Smoking Survey Pilot**

A pilot of the Smoking Survey was carried out by Betsy Partington on March 11, 1994 at Connaught School, St. Catharines.

The survey was administered orally to 22 grade 7 students following a script which was developed by Betsy Partington and Nancy O'Neill.

Results were as follows:

Administration time including directions - 20 minutes

Review of True and False answers - 10 minutes

Total administration - 30 minutes

Overview of finding;

Question 6 How many cigarettes do you usually smoke in one day?
- a. none - 18
- b. less than 3 - 3
- c. 3 - 5 - 1

Question 7 comments - no reason just wanted to try
just to see what it was like
I just wanted to try
curious

Question 18 Have you been taught a non-smoking program?
- a. P.A.L.S. - 0
- b. other - 4
- c. no - 17
- did not answer - 1

Questions 20 to 37 number of wrong answers

1 wrong - 1
2 wrong - 5
3 wrong - 5
4 wrong - 4
5 wrong - 5
6 wrong - 1
7 wrong - 1

Frequency of incorrect answer

QUESTION	FREQUENCY INCORRECT....
20	1
21	3
22	3
23	1
24	12
25	3
26	1
27	9
28	6
29	5
30	0
31	19
32	11
33	0
34	2
35	2
36	1
37	0

* How are we going to register unanswered questions and questions with two answers? For the purpose of this pilot I counted both as incorrect.

cc: Hazel Ann Blew
Joan Jones
Sandra Rifat
Nancy O'Neill
Betsy Partington
Harvie Hagerty
Betty Manson

THE REGIONAL MUNICIPALITY OF NIAGARA

MEMORANDUM

DATE: March 22, 1994

TO: Smoking Survey Committee

FROM: Karen Chudzik

SUBJECT: **Smoking Survey Pilot 2**

A pilot of the Smoking Survey was carried out by **Nancy O'Neill** on March 11,1994. The survey was administered orally to 23 grade seven students in St. Catharines.

Results were as follows:

Starting time	11:13
Finishing time	11:29
Adminstration time	16 minutes

* there is no mention of review of true and false questions

Comments:

- extraneous variable; last day of school before March Break

- problem

"I read off one survey in which #5 had (D), the survey they had did not have a (d). I had to tell them to include that choice."

question #13 (b), (d), (e) were switched differently from the one I had

question #7, 9, 11, and 12 What do we do if they to more than one

question #19 - what if I didn't do those activities - how do they respond?

Overview of findings:

Question 6 How many cigarettes do you usually smoke in one day?

a. none - 17
b. less than 3 - 5

* one not completed correctly

Question 7 comments - feel older
I was small I didn't know

QUESTION 18: Have you been taught a nonsmoking program?

A. PALS 4

B. Other 9

C. No 8

* 2 not completed correctly

QUESTION 20 to 37 - number of wrong answers

Question	Frequency Incorrect	Question	Frequency Incorrect
20	2	29	2
21	1	30	1
22	2	31	16
23	3	32	11
24	12	33	1
25	1	34	5
26	2	35	3
27	8	36	10
28	10	37	1

cc: Hazel Ann Blew
Joan Jones
Sandra Rifat
Harvie Hagerty
Betsy Partington
Nancy O'Neill

INTRODUCTION SMOKING SURVEY

This survey is being carried out with various grade 7 students from the Lincoln County Board. The information that we receive from you will be important to help us plan our future programs. This survey is strictly confidential. Do not put your name on it, fold it in half when you are finished so nobody else sees your answers. Therefore, answer as honestly as possible. There are no right or wrong answers for the section dealing with survey questions.

1. Write in the age you are today.

2. Check one that applies to you.

3. If you've only ever had one puff to experiment you would still check yes.

4. Write the age you first tried a cigarette. Write "0" if you've never tried one.

5. Other means anyone else other than with your friends.
   Add d never tried.
6. --

7. Check as many of the reasons as you feel apply to you. If you check the "other" response, fill in what that reason was in the blank provided.

8. Check as many of the answers as you feel apply to you.

9. Check as many of the reasons as you feel apply to you.
   Answer only if you are a non smoker
10. --

11. Check as many of the answers as you feel apply to you. If you check the "other" please write your answer on the line provided.

12. Check as many of the answers as you feel apply to you.

13. Check as many of the answers as you feel apply to you.

14. --

15. Check as many of the answers as you feel apply to you.

16. If you are presently smoking or have quit smoking answer how many times you have tried.

17. If a group started in your school about strategies or ways to help you quit smoking, would you attend. Answer only if you are a smoker.

18. Only choose one response.

19. "A" is PALS. This consisted of 6 classes which were given by the school nurse or the teacher. It involved such activities as role playing, skits and surveys.

    "B" is other. This would mean any other type of classes offered by your

Grade 7 Lincoln County Board of Education Smoking Survey

1. Age ____

2. a. ____ male b. ____ female

3. Have you ever tried smoking cigarettes? This means even one puff.

   a. ____ yes b. ____ no

4. How old were you when you tried your first cigarette? (Write 0 if never tried a cigarette.)

   a. ____ years old

5. Did you first try a cigarette by yourself or with friends?

   a. ____ self b. ____ friends c. ____ other

6. How many cigarettes do you usually smoke in one day?

   a. ____ none b. ____ less than 3

   c. ____ 3 - 5 d. ____ 6 and over

7. Why do you think you started to smoke cigarettes?

   a. ____ I have never smoked

   b. ____ most of my friends smoked

   c. ____ my parents smoked

   d. ____ my brother/sister smoked

   e. ____ fit in with a group

   f. ____ look older

   g. ____ control my weight

   h. ____ other _____

8. Where do you smoke?

   a. ____ home b. ____ public places

   c. ____ other's home d. ____ outside

   e. ____ I don't smoke

9. If you are a non-smoker, why did you choose not to smoke?

   a. ____ cost b. ____ appearance

   c. ____ illegal d. ____ parents

   e. ____ sports f. ____ addiction

   g. ____ health h. ____ unpleasant taste and smell

   i. ____ other

10. Do any of your friends smoke?

    a. ____ all b. ____ some
    c. ____ one d. ____ none

11. Do any of your relatives smoke?

    a. ____ father b. ____ mother

    c. ____ brothers d. ____ sisters

    e. ____ grandparents f. ____ none

    g. ____ other _____

12. Where do you get cigarettes?

    a. ____ friends b. ____ grocery store

    c. ____ home d. ____ corner store

    e. ____ pharmacy f. ____ other

    g. ____ vending machine h. ____ I don't smoke

13. Has a sales person given you a *"special deal"* on cigarettes?

    a. ____ cheaper b. ____ single cigarettes

    c. ____ small pack e. ____ I do not buy any

    d. ____ no

14. Has a store refused to sell you cigarettes?

    a. ____ yes b. ____ no

    c. ____ never tried to buy any

15. Does anybody pressure you to smoke?

    a. ____ friends b. ____ other students

    c. ____ relatives d. ____ no one

16. Have you tried to quit smoking?

    a. ____ no b. ____ 1-2 times

    c. ____ 3 or more d. ____ I don't smoke

17. If you are a smoker, would you attend a *"quit smoking"* program/group?

    a. ____ yes b. ____ no

18. Where do you get most of your smoking information?

    a. ____ friends b. ____ home

    c. ____ school d. ____ media

19. Have you had classes on smoking prevention?

a. ____ P.A.L.S. b. ____ other
c . ____ no

20. How did you feel about these non-smoking classes?

	LIKED	DISLIKED	PASS
a. Understanding advertising/social pressure	☺	☹	○
b. Role-playing (Skits)	☺	☹	○
c. Learning effects of tobacco on my body	☺	☹	○
d. Interviewing/Surveys	☺	☹	○
e. Tips on "How to Say No"	☺	☹	○
f. The laws about smoking	☺	☹	○

Now a few questions about Cigarettes & Smoking...

21. Smoking cigarettes is a form of drug use. ___ T ___ F
22. Most smokers are <u>not</u> addicted to cigarettes. ___ T ___ F
23. Smoking can cause heart attacks. ___ T ___ F
24. Smoke from other peoples' cigarettes can damage your health. ___ T ___ F
25. A person whose friends smoke is more likely to smoke. ___ T ___ F
26. Cigarette smoking is a leading cause of death in Ontario. ___ T ___ F
27. It is illegal for people under 18 years to buy cigarettes. ___ T ___ F
28. Smoking is relaxing. ___ T ___ F
29. After just one puff of a cigarette, the heart beats faster. ___ T ___ F
30. The only cancer caused by smoking is lung cancer. ___ T ___ F
31. Smoking is glamorous, fun and sophisticated. ___ T ___ F
32. More than 70% of Canadian adults do not smoke. ___ T ___ F
33. Smoking reduces a person's athletic ability. ___ T ___ F
34. Smoking during pregnancy can harm the baby. ___ T ___ F
35. Cigarette advertising can influence people to start smoking. ___ T ___ F
36. Smoking is allowed in all public places. ___ T ___ F
37. A smoking habit becomes associated with certain activities. ___ T ___ F
38. Name three things you can do to refuse cigarettes.
    a. _____
    b. _____
    c. _____

19. Have you had classes on smoking prevention?
    a. ____ P.A.L.S. b. ____ other
    c . ____ no

20. How did you feel about these non-smoking classes?

	LIKED	DISLIKED	PASS
a. Understanding advertising/social pressure	☺	☹	○
b. Role-playing (Skits)	☺	☹	○
c. Learning effects of tobacco on my body	☺	☹	○
d. Interviewing/Surveys	☺	☹	○
e. Tips on "How to Say No"	☺	☹	○
f. The laws about smoking	☺	☹	○

Now a few questions about Cigarettes & Smoking...

21. Smoking cigarettes is a form of drug use. __X__ T ___ F
22. Most smokers are <u>not</u> addicted to cigarettes. ___ T __X__ F
23. Smoking can cause heart attacks. __X__ T ___ F
24. Smoke from other peoples' cigarettes can damage your health. __X__ T ___ F
25. A person whose friends smoke is more likely to smoke. __X__ T ___ F
26. Cigarette smoking is a leading cause of death in Ontario. __X__ T ___ F
27. It is illegal for people under 18 years to buy cigarettes. __X__ T ___ F
28. Smoking is relaxing. ___ T __X__ F
29. After just one puff of a cigarette, the heart beats faster. __X__ T ___ F
30. The only cancer caused by smoking is lung cancer. ___ T __X__ F
31. Smoking is glamorous, fun and sophisticated. ___ T __X__ F
32. More than 70% of Canadian adults do not smoke. __X__ T ___ F
33. Smoking reduces a person's athletic ability. __X__ T ___ F
34. Smoking during pregnancy can harm the baby. __X__ T ___ F
35. Cigarette advertising can influence people to start smoking. __X__ T ___ F
36. Smoking is allowed in all public places. ___ T __X__ F
37. A smoking habit becomes associated with certain activities. __X__ T ___ F

38. Name three things you can do to refuse cigarettes.
    a. _____
    b. _____
    c. _____

Just Say No
Humour
Walk Away
Give health reason
Give an excuse
Broken record
Reverse the pressure
Avoid the situation
Strength in numbers

SCANTRON TEMPLATE

GRADE SEVEN LINCOLN COUNTY BOARD OF EDUCATION
SMOKING SURVEY

(Shaw Chudzik & Partington, 1994)

Name School Name

Course blank

Date blank

Student Number
- justify to the right
- if number 1 - 9 first purple column on right
- if more than one digit (e.g., 20)
- 2 is in second column on the right side (white)
- 0 is in the first column on the right (purple)

1. Age
- put in section block (e.g., 10 years)
- 1 white column
- 0 purple column

2. Sex
- put in lab/sem block
  male 1
  female 2

3. Start on line three of the ABCDE section below.

4. A = 0
B = 8 years and under
C = 9 or 10 years
D = 11 or 12 years
E = 13 years and up

5.

6.

7. is 7a

8. is 7b
9. is 7c
10. is 7d
11. is 7e
12. is 7f
13. is 7g
14. is 7h
15. is 8a
16. is 8b
17. is 8c
18. is 8d
19. is 8e
20. is 9a
21. is 9b
22. is 9c
23. is 9d
24. is 9e
25. is 9f
26. is 9g
27. is 9h
28. is 9i
29. is 10
30. is 11a
31. is 11b
32. is 11c
33. is 11d
34. is 11e
35. is 11f
36. is 11g
37. is 12a
38. is 12b
39. is 12c
40. is 12d
41. is 12e
42. is 12f
43. is 12g
44. is 12h
45. is 13a
46. is 13b
47. is 13c
48. is 13d
49. is 14a
50. is 14b
51. is 14c
52. is 15a
53. is 15b
54. is 15c
55. is 15d
56. is 16a
57. is 16b
58. is 16c
59. is 16d
60. is 17
61. is 18a
62. is 18b
63. is 18c
64. is 18d
65. is 19a
66. is 19b
67. is 19c
68. is 20a
69. is 20b
70. is 20c
71. is 20d
72. is 20e
73. is 20f
74. is 21
75. is 22
76. is 23
77. is 24
78. is 25
79. is 26
80. is 27
81. is 28
82. is 29
83. is 30
84. is 31
85. is 32
86. is 33
87. is 34
88. is 35
89. is 36
90. is 37

91. is 38 - A is 3 correct answers

B is 2 correct answers

C is 1 correct answer

D is 0 correct answers

June 7, 1994 K. Shaw Chudzik

APPENDIX F: LETTERS OF PERMISSION

HEALTH SERVICES DEPARTMENT
Office of The Medical Officer of Health
573 Glenridge Avenue, P.O. Box 3040
St. Catharines, Ontario L2R 7E3
Telephone: (905) 688-3762
Toll Free: 1-800-263-7248 FAX (905) 682-3901

April 7, 1994

Dear Principal,

Niagara Regional Health Services has collaborated with Harvie Hagerty, of the Lincoln County Board of Education, to provide your teachers and students with the most up to date curriculum in the area of health promotion.

Doctor Richard Schabas, Chief Medical Officer of Health has identified Tobacco Use as the most important public health problem in Ontario, with the vast majority of smokers becoming addicted in their teens. If we are to effect change and protect our youth from future disability and premature death we must work together to provide the state of the art smoking prevention programming.

As new research and relevant strategies for smoking prevention become available, it is necessary for us to evaluate the effectiveness of the present smoking prevention program. The program evaluation tool we wish to employ is that of a survey of grade seven students in your school. This survey will take approximately 30 minutes for the Public Health Nurse to administer and is designed to assess the students' smoking behaviours and their knowledge about tobacco use. The results of this survey will assist us to identify the strengths and the weaknesses in our present smoking prevention program and in the development of future programming.

Yours sincerely,

Karen Chudzik

Karen Chudzik, R.N., B.Sc.N.
Health Promoter
Tobacco Use Prevention

H J Hagerty

Harvie Hagerty
Coordinator Physical
Education and Health

Health Studies Program
Brock University
St. Catharines, Ontario
L2S 3A1
(905) 688-5550, ext. 3385
FAX (905) 688-0541

REQUEST FOR PERMISSION

Dr. Megan Ward, MD.,
Medical Officer of Health,
Niagara Regional Health Services Department,
St. Catharines, Ontario
L2R 7E3

May 17, 1994

Dear Dr. Ward,

Two employees with the Niagara Regional Health Services Department are currently enrolled in the degree of "Master of Education", at Brock University. Karen Chudzik and Betsy Partington have chosen to complete their degree requirements by working through thesis projects in the area of adolescent cigarette smoking.

Although Karen and Betsy will defend their projects separately, they have decided to base their research on the earlier work of the Grade Seven Cigarette Smoking Survey. As you may recall, the Grade Seven Cigarette Smoking Survey was a collaborative project between the Lincoln County Board of Education and the Health Promotion Division of the Niagara Regional Health Services Department.

Currently, the data is in survey form and is held by the Niagara Regional Health Services Department. As their thesis project supervisor, I am requesting that the data be released to Karen Chudzik and Betsy Partington, so that they may use the data in their thesis projects.

As is consistent with the rules for ethical research at Brock University, all data will remain confidential, and no individual subjects will be identified by name or identification code. The responses to the survey will be transcribed to "Scantron recording sheets" so that the data can be uploaded to a computer for statistical analyses. The original surveys will then be returned to the Niagara Regional Health Services Department. The electronic data set will be used in the specific analyses related to the theses projects, and will not be used for other projects without written permission of the Niagara Regional Health Services Department.

If you have any questions or comments regarding this proposal please feel free to contact me at your earliest convenience.

Sincerely,

William J. Montelpare, Ph.D.,
Director,
Health Studies Program

THE REGIONAL MUNICIPALITY OF NIAGARA

MEMORANDUM

DATE: June 7, 1994

TO: Dr.Ward, Medical Officer of Health

SUBJECT: **Request for permission to use smoking survey data**

I reviewed this request from three points of view: (1) Potential ethical concerns related to the violation of individual or group confidentiality, or to private use of information collected by a public agency; (2) Possible design or analytic flaws which could lead to erroneous interpretation and inference; and (3) Probability of public health benefit/risk associated with the proposed project(s).

(1) Given the nature of the questionnaire data, there is little reason for concerns regarding individual or group confidentiality. No individual or personal demographic data which could identify an individual were collected. The only opportunity for violation of confidentiality would be at the school level (i.e., individuals administering the schedules may have retained the separation by school, or coded this variable). There are reasons for interest in differences across schools (e.g., based on geographic distribution, size, urban/rural character); however, if there are differences between schools in smoking prevalence, there is no reason why the schools should be named. Use of data collected by HSD staff in theses work might be construed by some as special privilege; however, these data were collected for the purpose of evaluating programmes delivered by HSD, rather than for the theses work. Given that staff have little "work-time" to devote to analysis and interpretation of the collected data, it may be argued that the advantage goes to the Health Department: Opportunity to have collected data analyzed at no cost. A more tolerant view may be that this represents a "win-win" situation. An acknowledgement of the Health Services Department's role in project development and conduct would be appropriate.

(2) I am familiar with the questionnaire design process and product, the sampling strategy and planned protocol. The proposed thesis supervisor, Dr.Montelpare, is well qualified to provide direction and assistance with methods of analyses and levels of interpretation. I don't think there is room for concern regarding errors of omission or commission with this data set. However, if there is to be "credit given" to the Health Services Department [as per #1], there should also be the opportunity for a representative of the HSD to review the works, perhaps as a member of the thesis examination committee(s).

(3) The purpose of the project as originally designed was to determine whether there were differences between groups of grade 7 students who had/hadn't PALS (or other anti-smoking education programme) in grade 6. A few other variables considered possible effect modifiers (e.g., whether friends and family smoke) were also included. The sample selected was stratified on the basis of school size, urban/rural, and sets "fed" by schools which had a grade 6 PALS programme the previous year. In my opinion, there is potential for the findings to be of interest, both in evaluating the effectiveness of grade 6 anti-smoking education, and in identifying possibly influential variables. [For example, perhaps PALS was more influential amongst those whose parents smoke, or less influential in small rural schools with low prevalence of smoking without anti-smoking campaign...] Properly analyzed and written up, the findings should be "publishable" in the Canadian Journal of Public Health. More importantly, they could be of practical interest.

In summary, my recommendation would be to permit the use of these questionnaire data as the basis of theses projects conducted by Karen Chudzik and Betsy Partington, under the direction of Dr.Bill Montelpare, with the conditions that: (a) School identity be protected; (b) HSD be acknowledged as source of data, and retain ownership[1]; and (c) An HSD representative be an external reviewer of the theses. A more cautious approach would be to ask for research proposals prior to your authorization of release of the data.

With respect,

SL Rifat, PhD
Epidemiology Divison

[1] This was implied by the process described in Dr.Montelpare's letter.

NIAGARA
HEALTH SERVICES DEPARTMENT
Office of The Medical Officer of Health
573 Glenridge Avenue
St. Catharines, Ontario L2T 4C2
Telephone: (905) 688-3762
Toll Free: 1-800-263-7248 FAX (905) 682-3901

23 June 1994

Dr.Wm.J.Montelpare, Director
Health Studies Program
Brock University
St.Catharines, Ontario
L2S 3A1

Dear Dr.Montelpare,

In reply to your letter of 17 May 1994, it is gratifying to know that Karen Chudzik and Betsy Partington are progressing well in the Brock University program, and are now prepared to undertake their Masters degree thesis projects.

As you noted, the *Grade Seven Smoking Survey* was undertaken with the cooperation of the Lincoln School Board as an evaluation of the *PALS* education offered to grade 6 students through the Adolescent Health Program of the Health Services Department. The survey was initiated as a collaborative project of the Adolescent Health Program in the Nursing Division and the Tobacco Use Program in the Health Promotion Division, which was recently reorganized as the Healthy Lifestyles Division under the direction of Ellen Wodchis. The Epidemiology Division provided consultation on survey design and sampling strategies. The request that these data be released for the purposes of analyses and reporting by Karen Chudzik and Betsy Partington has been conditionally approved by the responsible program manager and division directors.

The conditions for approval of the release of the data collected in the *Grade Seven Smoking Survey*, now held by the Health Services Department are that:

1) Data entry, analyses and interpretation will be completed under your direct supervision;

2) Survey forms, and a copy of the entered data set [in ASCII format] will be returned to the Health Services Department when data entry is completed;

3) Confidentiality with respect to the identity of specific schools will be protected in any written or verbal reports of the findings;

4) Niagara Regional Health Services Department and the Lincoln School Board will be acknowledged in publications of the findings;

5) Information required to document and monitor the status of these projects, and reports of the findings will be provided to the Health Services Department.

With respect to the last condition, we are currently in the process of developing internal guidelines for research involving Health Services Department staff, premises and clients. These will include provisions for the review of research proposals, monitoring and reporting on the status of research projects by a Research Committee. It has been proposed that the position of Research Coordinator on this committee be filled by the incumbent Director of the Epidemiology Division. Although the Research Committee has not yet been formed, it would be appropriate to direct copies of the research proposals and further information regarding these projects to Dr.S.L.Rifat, current Director of Epidemiology.

Under these conditions, we are pleased to release the *Grade Seven Cigarette Smoking Survey* data to Karen Chudzik and Betsy Partington for analyses and reporting of results as their theses work.

With regards,

Megan Ward,MD,MHSc,CCFP,FRCP(C)
Medical Officer of Health

cc:
Ms. Ruth Ferguson, Director of Nursing Division
Ms. Ellen Wodchis, Director of Healthy Lifestyles Division
Ms. Hazel Ann Blew, Manager of Adolescent Health Program
Ms. Betsy Partington, Adolescent Health Program
Ms. Karen Chudzik, Tobacco Use Program
Dr. SL Rifat, Director of Epidemiology

Appendix G: Background Data Charts and Tables

QUESTIONS ABOUT CIGARETTES & SMOKING

Have you ever tried smoking a cigarette? This means even one puff.

YES - HAVE TRIED SMOKING

Sample	Frequency	Percent
Total Group	164	36.6%
Males	100	42.2%
Females	64	30.2%
Had PAL	73	36.9%
Had other program	55	34.8%
No program	36	43.9%

NO - HAVE NOT TRIED SMOKING

Sample	Frequency	Percent
Total Group	283	63.2%
Males	136	57.6%
Females	147	69.3%
Had PAL	124	62.6%
Had other program	103	65.2%
No program	46	56.1%

QUESTIONS ABOUT CIGARETTES & SMOKING

HAVE YOU TRIED TO QUIT SMOKING?

SAMPLE		Frequency	Percent
Total	No	24	5.4%
	1 - 2 times	59	13.2%
	3 or more	9	2.0%
	I don't smoke	**355**	**79.4%**
Males	No	13	5.5%
	1- 2 times	33	14.0%
	3 or more	7	3.0%
	I don't smoke	**183**	**77.5%**
Females	No	11	5.2%
	1 -2 times	26	12.3%
	3 or more	2	0.9%
	I don't smoke	**172**	**81.5%**

Frequency of nonrespondents missing = male 1, female 1

QUESTIONS ABOUT CIGARETTES & SMOKING

How many cigarettes do you usually smoke in one day?

NONE

Sample	Frequency	Percent
Total Group	392	88.1%
Males	205	87.2%
Females	187	89.0%
Had PAL	174	88.8%
Had other program	143	91.1%
No program	65	79.3%

LESS THAN 3 CIGARETTES IN ONE DAY

Sample	Frequency	Percent
Total Group	38	8.5%
Males	22	9.4%
Females	16	7.6%
Had PAL	16	8.2%
Had other program	11	7.0%
No program	11	13.4%

QUESTIONS ABOUT CIGARETTES & SMOKING

How many cigarettes do you usually smoke in one day?

3-5 CIGARETTES PER DAY

Sample	Frequency	Percent
Total Group	10	2.2%
Males	4	1.7%
Females	6	2.9%
Had PAL	6	3.1%
Had other program	3	1.9%
No program	1	1.2%

Frequency of nonrespondents = males 2, females 2

6 OR MORE CIGARETTES PER DAY

Sample	Frequency	Percent
Total Group	5	1.1%
Males	4	1.7%
Females	1	0.5%
Had PAL	0	0
Had other program	0	0
No program	5	6.1%

Frequency of non-respondents to = males 2, females 2

QUESTIONS ABOUT CIGARETTES & SMOKING

IF YOU DO NOT SMOKE WHY?

Males		Frequency	Percent	Ranking Order
cost	Yes	121	54.82%	5
	No	100	45.2%	
appearance	Yes	104	47.3%	7
	No	120	51.3%	
illegal	Yes	85	38.6%	8
	No	135	61.4%	
parents	Yes	121	55%	4
	No	99	45%	
sports	Yes	129	58.6%	3
	No	91	41.4%	
addiction	Yes	112	51.1%	6
	No	107	48.9%	
health	Yes	172	78.5%	1
	No	47	21.5%	
unpleasant taste & smell	Yes	132	60.3%	2
	No	87	39.7%	
other	Yes	44	20.1%	9
	No	175	79.9%	

QUESTIONS ABOUT CIGARETTES & SMOKING

IF YOU DO NOT SMOKE, WHY?

Females		Frequency	Percent	Ranking order
cost	Yes	78	39.2%	5
	No	121	60.82%	
appearance	Yes	97	48.7%	3
	No	120	51.3%	
illegal	Yes	76	38%	6
	No	108	62%	
parents	Yes	92	46%	4
	No	100	54%	
sports	Yes	63	31.7%	7
	No	136	68.3%	
addiction	Yes	128	64%	2
	No	72	36%	
health	Yes	167	83.5%	1
	No	33	16.5%	
unpleasant taste & smell	Yes	128	64%	2
	No	72	36%	
other	Yes	49	24.5%	8
	No	151	75.5%	

QUESTIONS ABOUT CIGARETTES & SMOKING

Question:

Smoking cigarettes is a form of drug use.

Sample	Answer	Frequency	Percent
Total	correct	417	93.5%
	incorrect	29	6.5%
Males	correct	216	92.3%
	incorrect	17	7.7%
Females	correct	201	94.8%
	incorrect	11	5.2%
Had PAL	correct	147	93.6%
	incorrect	10	6.4%

Frequency of nonrespondents = males 3, had PAL 2

QUESTIONS ABOUT CIGARETTES & SMOKING

Question:

Most smokers are <u>not</u> addicted to cigarettes.

Sample	Answer	Frequency	Percent
Total	correct	422	94.2%
	incorrect	26	5.0%
Males	correct	220	93.2%
	incorrect	16	6.8%
Females	correct	202	95.3%
	incorrect	10	4.7%
Had PAL	correct	150	94.9%
	incorrect	8	5.1%

Frequency of nonrespondents = male 1, had PAL 1

QUESTIONS ABOUT CIGARETTES & SMOKING

Question:

Smoking can cause heart attacks.

Sample	Answer	Frequency	Percent
Total	correct	428	95.7%
	incorrect	18	4.0%
Males	correct	224	95.3%
	incorrect	11	4.7%
Females	correct	204	96.2%
	incorrect	8	3.8%
Had PAL	correct	149	94.3%
	incorrect	9	5.7%

Frequency of nonrespondents = male 2, had PAL 1

QUESTIONS ABOUT CIGARETTES & SMOKING

Question:

Smoke from other people's cigarettes can damage your health.

Sample	Answer	Frequency	Percent
Total	correct	426	95.1%
	incorrect	22	4.9%
Males	correct	225	95.3%
	incorrect	11	4.7%
Females	correct	201	94.8%
	incorrect	11	5.2%
Had PAL	correct	150	94.9%
	incorrect	8	5.1%

Frequency of nonrespondents = male 1, had PAL 1

QUESTIONS ABOUT CIGARETTES & SMOKING

Question:

A person whose friends smoke is more likely to smoke.

Sample	Answer	Frequency	Percent
Total	correct	368	82.7%
	incorrect	77	17.3%
Males	correct	202	86.0%
	incorrect	33	14.0%
Females	correct	166	79.0%
	incorrect	44	21.0%
Had PAL	correct	130	82.3%
	incorrect	28	17.7%

Frequency of nonrespondents = males 2, females 2, had PAL 1

QUESTIONS ABOUT CIGARETTES & SMOKING

Question:

Cigarette smoking is a leading cause of death in Ontario.

Sample	Answer	Frequency	Percent
Total	correct	360	81.6%
	incorrect	81	18.4%
Males	correct	188	80.7%
	incorrect	45	19.3%
Females	correct	172	82.7%
	incorrect	36	17.3%
Had PAL	correct	134	85.4%
	incorrect	23	14.6%

Frequency of nonrespondents = males 4, females 4, had PAL 2

QUESTIONS ABOUT CIGARETTES & SMOKING

Question:

Is it illegal for people under 18 years to buy cigarettes?

Sample	Answer	Frequency	Percent
Total	correct	409	91.9%
	incorrect	81	8.1%
Males	correct	214	91.5%
	incorrect	20	8 5%
Females	correct	195	92.4%
	incorrect	16	7.6%
Had PAL	correct	144	91.7%
	incorrect	13	8 3%

Frequency of nonrespondents = males 2, females 2, had PAL 1

QUESTIONS ABOUT CIGARETTES & SMOKING

Question:

Smoking is relaxing.

Sample	Answer	Frequency	Percent
Total	correct	295	67.7%
	incorrect	141	32.3%
Males	correct	141	61.6%
	incorrect	88	38%
Females	correct	154	74.4%
	incorrect	53	25.6%
Had PAL	correct	105	67.3%
	incorrect	51	32.7%

Frequency of nonrespondents = males 8, females 5, had PAL 3

QUESTIONS ABOUT CIGARETTES & SMOKING

Question:

After just one puff of a cigarette, the heart beats faster.

Sample	Answer	Frequency	Percent
Total	correct	355	81.1%
	incorrect	83	18.9%
Males	correct	183	78.5%
	incorrect	50	21.4%
Females	correct	172	83.9%
	incorrect	33	16.1%
Had PAL	correct	119	76.8%
	incorrect	36	23.2%

Frequency of nonrespondents = males 4, females 7, had PAL 4

QUESTIONS ABOUT CIGARETTES & SMOKING

Question:

The only cancer caused by smoking is lung cancer.

Sample	Answer	Frequency	Percent
Total	correct	358	80.8%
	incorrect	85	19.2%
Males	correct	187	79.6%
	incorrect	48	20.4%
Females	correct	171	82.2%
	incorrect	37	17.8%
had PAL	correct	128	81.0%
	incorrect	30	19.0%

Frequency of nonrespondents = males 2, females 4, had PAL 1

QUESTIONS ABOUT CIGARETTES & SMOKING

Question:

Smoking is glamorous, fun and sophisticated.

Sample	Answer	Frequency	Percent
Total	correct	422	94.6%
	incorrect	24	5.4%
Males	correct	218	92.8%
	incorrect	17	7.2%
Females	correct	204	96.7%
	incorrect	7	3.3%
Had PAL	correct	154	98.1%
	incorrect	3	1.9%

Frequency of nonrespondents = males 2, females 1, had PAL 2

QUESTIONS ABOUT CIGARETTES & SMOKING

Question:

More than 70% of Canadian adults do not smoke.

Sample	Answer	Frequency	Percent
Total	correct	119	26.9%
	incorrect	324	73.1%
Males	correct	76	32.7%
	incorrect	156	67.3%
Females	correct	44	20.9%
	incorrect	167	79.1%
Had PAL	correct	38	24.2%
	incorrect	119	75.8%

Frequency of nonrespondents = males 5, females 1, had PAL 2

QUESTIONS ABOUT CIGARETTES & SMOKING

Question:

Smoking reduces a person's athletic ability.

Sample	Answer	Frequency	Percent
Total	correct	401	90.1%
	incorrect	44	9.9%
Males	correct	212	91%
	incorrect	21	9.0%
Females	correct	189	89.2%
	incorrect	23	10.8%
Had PAL	correct	142	89.9%
	incorrect	16	10.1%

Frequency of nonrespondents = males 4, had PAL 1

QUESTIONS ABOUT CIGARETTES & SMOKING

Question:

Smoking during pregnancy can harm the baby.

Sample	Answer	Frequency	Percent
Total	correct	437	98%
	incorrect	9	2.0%
Males	correct	231	97.9%
	incorrect	5	2.1%
Females	correct	206	98.1%
	incorrect	4	1.9%
Had PAL	correct	153	96.0%
	incorrect	5	3.2%

Frequency of nonrespondents = males 1, females 2, had PAL 1

QUESTIONS ABOUT CIGARETTES & SMOKING

Question:

Cigarette advertising can influence people to start to smoke.

Sample	Answer	Frequency	Percent
Total	correct	406	91.0%
	incorrect	40	9.0%
Males	correct	215	91.9%
	incorrect	19	8.1%
Females	correct	191	90.1%
	incorrect	21	9.09%
Had PAL	correct	139	88.0%
	incorrect	19	12.0%

Frequency of nonrespondents = males 3, had PAL 1

QUESTIONS ABOUT CIGARETTES & SMOKING

Question:

Smoking is allowed in all public places.

Sample	Answer	Frequency	Percent
Total	correct	412	92.4%
	incorrect	34	7.6%
Males	correct	213	91.0%
	incorrect	21	9.0%
Females	correct	199	93.9%
	incorrect	13	6.1%
Had PAL	correct	149	95.5%
	incorrect	7	4.5%

Frequency of nonrespondents = males 3, had PAL 3

QUESTIONS ABOUT CIGARETTES & SMOKING

Question:

A smoking habit becomes associated with certain activities.

Sample	Answer	Frequency	Percent
Total	correct	290	67.0%
	incorrect	143	33.0%
Males	correct	152	66.1%
	incorrect	78	33.9%
Females	correct	138	68.0%
	incorrect	65	32.0%
Had PAL	correct	101	66.4%
	incorrect	51	33.6%

Frequency of nonrespondents = males 7, females 9, had PAL 7